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UNITED STATES

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CHARLES WILKES, U.S.N.

VOL. XX.

HERPETOLOGY.

by Charles Girard

PREPARED UNDER THE SUPERINTENDENCE OF

S. Spencer F. BAIRD.

WITH A FOLIO ATLAS.

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INTRODUCTION.

THE Joint Committee of the Library of Congress entered into an engagement with the undersigned, in 1851, to prepare the Report upon the Herpetological collections made by the United States Exploring Expedition. Finding that other duties would interfere with the proper performance of the work, he was permitted to associate Dr. Girard with him in its execution; by whom the determinations and descriptions have been made, the drawings overlooked, and the work carried through the press.

S. F. BAIRD.

WASHINGTON, May, 1858.

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Ordo I. BATRACHIA.

The reptiles known under the vernacular names of salamanders, frogs, tree-frogs, and toads, together with the group of Ceciloid, constitute the natural order of Batrachians. The peculiar metamorphoses which some of them undergo, have made of them one of the most interesting group of animals both to physiologists and zoologists.

In one tribe, these metamorphoses are of a very prominent order: we allude to the frogs and toads. The tadpoles, as the young of these latter are called, are provided with a tail, wanting at the same time both pairs of legs. They, furthermore, lead a purely aquatic life; breathing through the means of gills, situated on either side of the neck, altogether unprotected, and fish-like in their external aspect. By degrees the legs make their appearance, and the tail diminishing, until it is entirely absorbed. Meanwhile the lungs are developed, and the gills atrophy; a complete change in their mode of life takes place: they leave the water and take to the dry land.

The majority of the caudate Batrachians (*Urodela*), undergo likewise metamorphoses in their mode of breathing: at first, this act is performed through the means of gills, whose function is gradually superseded by that of the lungs.

From this twofold mode of life of these Batrachians, the Order to which they belong has often been called the Order of *Amphibia*.

The structure of the heart and the system of circulation has led some naturalists to look upon the Batrachians as constituting a class by themselves, more intimately allied to the class of fishes than to that of reptiles, properly so called. That structure, added to the metamorphoses above alluded to, and to the facts, that there are no external organs of generation in the males, and that the external envelope of

the eggs is membranous, which eggs are mostly laid before the act of fecundation takes place, are, indeed, strong analogies of what is observed in most fishes. Still, the general opinion now is, that the affinities of the Batrachians with the other reptiles are most intimate, and that their true place in the organic scale, is in the latter class, in which they constitute a natural order.

The true affinities of the Batrachians with the other reptiles, consist in the structure of their skeleton: there are two occipital condyles uniting the skull to the vertebral column, and in the majority of them we observe a distinct sternum, although not combined with the ribs, themselves rather short.

Tribus I. BATRACHIA URODELA.

Body elongated, lacertiform, tapering, provided with a tail in the adult as well as in the young; having generally four limbs, and sometimes only two; the fingers and toes being always clawless. Skin naked, either perfectly smooth, warty, or granular. There are teeth on both jaws, and often on the vomer and sphenoid bones also. No external auricular aperture. Inner nostrils situated in the middle of the palate. Vent longitudinal. Neither sternum nor clavicle.

Syn.—*Urodèles*, Dum. Zool. anal. 1806.—Dum. & Bibr. Erpét. gén. VIII, 1841, 15; &, IX, 1854, 1.

Observ.—Generally known under the name of salamanders, in opposition to the frogs and toads, and which constitute the tribe of ecaudate Batrachians (*Batrachia anura*), the caudate Batrachians (*Batrachia urodela*), resemble the lizards in their general appearance, and are often confounded with them by the uninitiated. A feature by which they can at once be distinguished from the lizards, consists in their naked skin; whilst lizards exhibit either scales of various forms and structure, else granular epidermic indurations of a peculiar type. Besides, should the integuments leave us in doubt as to the nature of the animals under consideration, there are other characters to which

we may have recourse. Thus, whatever be the number of fingers and toes, they are always clawless in these Batrachians, for, the geckos, which are amongst lizards those that might be mistaken for them, although deficient in the development of their toes, will, nevertheless, always exhibit enough of these organs to guide the observer without any difficulty. The absence of external auricular apertures, is another feature peculiar to the tailed Batrachians, and but seldom met with amongst lizards; and, finally, the longitudinal anal aperture is not the least amongst the distinguishing traits of these two divisions of animals.

The tailed Batrachians subdivide into two groups:

α. TREMATODEIRA,

WHERE we observe either external or internal gills persisting throughout life. When the gills are internal, there are branchial fissures or apertures on the sides of the neck.

SYN.—*Trématodères*, DUM. & BIBR. Erpét. gén. VIII, 1841, 53; &, IX, 1854, 174.

OBSERV.—None of which were collected by the Expedition.

β. ATRETODEIRA.

WHEN fully grown there are neither external nor internal gills, hence no branchial apertures. The young, however, are provided with external gills, which they gradually lose in growing up to maturity. At this latter period of their existence, the lungs are called into play, through the means of which they breathe the atmospheric air.

SYN.—*Atrétodères*, DUM. & BIBR. Erpét. gén. VIII, 1841, 53; &, IX, 1854, 36.

OBSERV.—The species of Urodelian Batrachians collected by the Expedition are but four in number, all of which belong to the second group, that in which the gills and branchial apertures become obliterated when entering upon the period of maturity, or full-grown state.

These four species are distributed into four genera, one of which belongs to the family of *Salamandridae*, and the three others to that of *Plethodontidae*.

Fam. SALAMANDRIDAE.

Palatine teeth extant, and disposed upon two diverging or else parallel series, along the inner hinder edge of the vomero-palatine bones, which are elongated. Sphenoid bone toothless.

Syn.—*Salamandridae*, Gray, Ann. of Philos. 1825, 215.—Bonap. Saggio Distr. metod. Anim. vertebr. 1831, 84.—Gray, Catal. Amph. Brit. Mus. II, 1850, 14.

Observ.—All the genera which constitute the present family are characterized by the peculiar disposition of the palatine teeth, which are arranged upon two longitudinal series; "one on the inner hinder edge of each of the elongated triangular vomerine bones," as observed by J. E. Gray. The sphenoid bone is toothless. The tongue is broad; free laterally, and more or less free also posteriorly.

Genus TARICHA, Gray.

Gen. Char.—Head broad, depressed. Snout protruding slightly beyond the lower jaw. Tongue rather small, rounded or elliptical, attached by almost its whole under surface. Palatine teeth disposed upon two longitudinal series, forming an elongated and very acute angle. Maxillary teeth rather small. Tail very long and compressed. Four fingers and five toes, entirely free, broad and depressed. Skin either smooth or granular.

Syn.—*Taricha*, Gray, Catal. Amph. Brit. Mus. II, 1850, 25.

Observ.—With a general resemblance to Tritons, the species of this genus may be readily distinguished from the latter by the inconspicuousness of the maxillary teeth, by a much smaller tongue, and by the absence of a series of pores on either side of the abdomen.

Eschscholtz, in his "Zoologischer Atlas," has furnished us with valuable information regarding the anatomical structure and zoological characters of this genus.

Two species of the genus *Taricha* have so far been described; both inhabiting the western coast of North America. One of these was

brought home by the Expedition; is figured and described further on; the other was collected at San Francisco, Cal., by Dr. John L. Leconte, and recorded under the name of *Taricha lævis*;* it being perfectly smooth, and furthermore distinguished from *Taricha torosa* by proportionally smaller eyes and more elongated toes.

Hallowell's *Salamandra lugubris*, doubtfully referred by J. E. Gray† to the genus *Taricha*, is entirely distinct from the latter, and constitutes now the genus *Anaides*, described further on.

Taricha torosa, Gray.

(Plate I, figs. 1–8.)

Spec. Char.—Tail longer than the head and body together, compressed, provided with a slightly elevated membranous keel upon its upper and lower edges. Tip of toes callous; inner toe in both pair of limbs very small. Skin granular. Color blackish-brown above, with minute pale dots; sides of abdomen orange; beneath yellowish.

Syn.—*Triton torosus*, Eschsch. Zool. Atl. V. 1833, 12. Taf. xxi, fig. 15.

Triton ermani, Wiegm. in *Erman's* Reise um die Erde, 1835, ... ; and Arch. für Naturg. 1836, II, 250.

Salamandra beecheyi, Gray, in *Beechey's* Voy. to the Pacif. Zool. 1839, 99.

Triton granulosus, Skilt. Amer. Journ. of Sci. VII, 1849, 202. Pl. figs. 4 and 5.

Notophthalmus torosus, Baird, Journ. Acad. Nat. Sci. Philad. Second Series, I, 1850, 284.

Pleurodeles californiae, Bibr. in Mus. Zool. Soc. London. (Fide Gray.)

Taricha torosa, Gray, Catal. Amph. Brit. Mus. II, 1850, 25.

Descr.—The head is broad and depressed, the upper surface being subconvex. Viewed from above, it is subelliptical in shape, longer than broad. The snout is subtruncated, and the temporal region swollen. The eyes are of medium size, elliptical in shape. The distance between the anterior rim of the eye and the extremity of the snout is equal to one and a half diameter of the eye. The nostrils are subterminal, and far apart. The upper jaw overlaps the lower, the mouth being but moderately cleft, and extending posteriorly a

* Proc. Acad. Nat. Sci. Philad. VI, 1853, 302.

† Catal. Amph. Brit. Mus. Part II, 1850, 26

little beyond the posterior rim of the orbit. When the mouth is closed, its posterior third is entirely overlapped by a horny expansion of the upper jaw. The teeth, on both jaws, are very minute, slender and acute, disposed upon one irregular row. The vomero-palatine teeth are not conspicuous, and in order to ascertain their presence a magnifying glass is required.

The body is subcylindrical; thickest upon its middle, and diminishing slightly anteriorly, more so posteriorly. The tail, longer than the body and head together, is very much compressed, roundish upon its origin, but very thin towards its posterior extremity. It is provided, above and below, with a membranous, fin-like expansion, extending from near the base to its very tip.

The fore and hind limbs are almost of the same stoutness and length; the toes, in both, are depressed. The anterior limbs have four toes, the innermost of which being very small; the third is the longest; the second a little shorter than the third; the fourth, or outermost, being still shorter than the second. There are five toes to the hind limbs; the innermost, the smallest; the outermost, a little larger than the latter; the third, the longest; the second, a little shorter than the fourth. The extremities are callous in all.

The skin, owing to the presence of small tubercles, has a granulated appearance throughout. The tubercles are irregularly distributed all over the head, body, tail, and membranous expansion, limbs, toes, and under surface of the body and head; nearly as thickly beset on one region, as on the other, mayhap, a little more numerous upon the head. The tubercles themselves are smooth; the intervening space is covered with exceedingly minute granules.

No sooner immersed in alcohol, specimens contract considerably, and then exhibit folds of the skin, which are not observed on live individuals. There are no systems or series of pores visible upon any region of the body, as is the case in Tritons. Minute pores are scattered all over the body, in the same manner as the tubercles themselves.

The color of the head, body, and limbs, is brownish-black above; reddish-brown, in specimens preserved in alcohol. The iris is black. Small light spots may be seen upon the head and anterior portion of the body. The sides of the abdomen and limbs, also the lower portion of the tail, are reddish-orange. The inferior surface of the head, belly, and limbs, is dull-yellow or brownish-yellow.

Many specimens of this species were collected in 1841, at Nisqually, Puget Sound (Oregon), and San Francisco (California). The sketch from life was made from Puget's Sound specimens by Jos. Drayton.

Plate I, fig. 1, represents *Taricha torosa ;* size of life and in profile.

Fig. 2, exhibits the under surface of the same specimen.

Fig. 3, is an outline of the head, seen from above, showing the wide interocular space.

Fig. 4, shows the head in profile, and exhibits the cleft of the mouth.

Fig. 5, is a front view of the head.

Fig. 6, a view of the inferior floor of the mouth, in order to show the shape and size of the tongue.

Fig. 7, is the upper floor of the mouth, exhibiting the inner nostrils, and the position of the teeth.

Fig. 8, represents a magnified portion of the skin, taken upon the dorsal region, giving an idea of its structure.

Fam. PLETHODONTIDAE.

Vomero-palatine teeth disposed upon one series across the posterior extremity of the vomerine bones, thus constituting a cross band behind the inner nostrils, in front of the palate. Sphenoid oftentimes covered with teeth. Vomerine bone broad and short. Skin generally smooth, rarely granular, and without any series of pores.

Syn.—*Plethodontidae*, Gray, Catal. Amph. Brit. Mus. II, 1850, 31.

Observ.—The above characters of the *Plethodont* family are mostly derived from the "Catalogue of Amphibia in the British Museum."

Genus ANAIDES, Baird.

Gen. Char.—Head, subelliptical, broader than the body; snout, bluntly truncated, and protruding beyond the lower jaw. Cleft of the mouth, undulating, as in the alligator. Maxillary teeth very large, compressed, lanceolated, and sharp, with edge minutely

crenated; largest upon the lower jaw, and all, apparently, unattached to the bone, but united to the gum, and admitting of a depression backwards. Vomero-palatine teeth inconspicuous; disposed upon an obtuse-angled triangle, behind the inner nostrils, which consist merely in a notch in the posterior edge of the palatine floor. Sphenoid teeth in two elongated and approximated patches. Tongue large, cordiform, attached along its median line only. Eyes, large and prominent. Limbs, rather slender; four fingers and five toes, slender, free, and terminated by a small rounded callous disk. Tail, subcylindrical, slightly compressed and attenuated. Skin smooth and soft.

SYN.—*Anaides*, BAIRD, Iconogr. Ency. II (1st ed.), 1849, 256.

OBSERV.—The affinities of this genus will place it near *Plethodon*, in a natural method, perhaps, even between the latter and *Desmognathus*.

ANAIDES LUGUBRIS, Baird.

(Plate I, figs. 26–33.)

SPEC. CHAR.—Body rounded. A fold of the skin under the neck. Tail, tapering; almost as long as the body and head together. Inner finger and toe quite small. Uniform dark-olive above, light-olive beneath. Sometimes scattered yellowish spots over the head, sides, and back.

SYN.—*Salamandra lugubris*, HALLOW. Proc. Acad. Nat. Sci. Philad. IV, 1848, 126.

Anaides lugubris, BAIRD, Iconogr. Encycl. II (1st ed.), 1849, 256.—B. & G. in Proc. Acad. Nat. Sci. Philad. VI, 1853, 302.

Taricha lugubris, GRAY, Catal. Amph. Brit. Mus. Part II, 1850, 26.

DESCR.—The head is elongated; very much depressed, flattened, and, when viewed from above, has almost an elliptical appearance. The snout is very prominent, protruding beyond the lower jaw. The nostrils are elevated; lateral, subterminal, and far apart. The eyes, very prominent; their diameter enters only once in the distance between their anterior rim and the extremity of the snout. The cleft of the mouth is large and undulating. The maxillary teeth are proportionally large, especially on the lower jaw; they are lanceo-

lated in shape; very acute and thin. The palatine teeth are inconspicuous, rather blunt, disposed upon an open V-shaped figure, the summit of which being directed backwards, whilst its branches extend to the internal and posterior margin of the inner nostrils. There are two elongated patches of minute teeth on the sphenoid, closely approximating anteriorly and diverging slightly posteriorly, where they are rounded and broadest. The cordiform or peltate tongue fills the whole space of the inferior floor of the mouth; it is attached along its medial line, whilst its sides are perfectly free, as is also, slightly, its tapering tip and its posterior bilobed expansion.

The neck is elongated, and slightly contracted; a distinct and well-marked gular fold may be observed on the specimens before us. It will be important to ascertain whether that fold exists during life, since its presence has been contested by some writers.

The body is subfusiform, diminishing towards both extremities. The sides of the abdomen are transversely folded, mayhap, an effect of artificial contraction. The tail is almost as long as the head and body together; it is subcylindrical, somewhat compressed, and tapering away; its upper and lower edges are rounded.

The limbs, generally speaking, are slender, the posterior ones a little longer and stouter than the anterior. When the former are brought forwards, and the latter backwards, alongside the body, the toes of either are caused to meet with each other. The toes themselves are slender, entirely free, and terminated by a callous, disk-like expansion, resembling, in that respect, the species of the genus *Œdipus*. The anterior inner toe is quite small; the third is the longest; the second, nearly equal in size to the fourth. The posterior inner toe is small also; the third and fourth are the longest, and almost equal in length; the second and fourth, again, are nearly equal.

The skin appears quite smooth; when examined under the microscope, however, it is found to contain a meshwork of minute, irregularly stelliform bodies, as exhibited (though very imperfectly) in figure 33, each stella having a hollow or clear centre.

The color, as preserved on specimens in alcohol, is of a uniform dark-olive above, and light-yellow beneath.

Collected at San Francisco, California.

Plate I, fig. 26, represents *Anaides lugubris*, size of life, in profile.

Fig. 27, exhibits the under surface of the same animal.

Fig. 28, is a view of the head from above, showing the distance between the eyes.

Fig. 29, a profile of the head, showing the undulated cleft of the mouth.

Fig. 30, is a front view of the head.

Fig. 31, the inferior floor of the mouth, showing the tongue.

Fig. 32, the upper floor of the mouth, exhibiting the patches of sphenoid teeth, the disposition of the vomero-palatine ones, and the inner nostrils.

Fig. 33, a somewhat magnified view of a fragment of skin, exhibiting the granules it contains. Under a higher power, these granules are irregularly star-like in shape.

Genus HEREDIA, Girard.

Car. gen.—*Capite subelliptico, et quam corpus ampliore; rostro obtuso, rotundiformi, ultra maxillam inferiorem protrudente. Oris rictu obliquo, rectilineari. Dentibus maxillaribus minutissimis, vixque visibilibus. Dentibus vomero-palatinis in duplicem arcum acutum, qui ex sphenoidalis extremitate anteriore per palati marginem posteriorem extendunt atque e naribus interioribus aperturam angustam efficiunt, dispositis. Dentibus sphenoidalibus in duas areas oblongas ordinatis. Lingua ampla, elliptica, centrali quadam radice fixa, tertiaque ejus parte posteriore libera manente. Oculis magnis. Cruribus gracilibus, anterioribus longioribus; digitis palmarum quatuor, plantarum quinque, omnibus distinctis et attenuantibus. Cauda subcylindrica, paulum compressa, in extremitate gradatim minuente. Cute externa lævi et molli.*

Gen. Char.—Head, subelliptical, broader than the body. Snout, blunt and rounded; protruding beyond the lower jaw. Cleft of the mouth, oblique and rectilinear. Maxillary teeth exceedingly minute, scarcely perceptible. Vomero-palatine teeth disposed upon a double ogive, extending from the anterior extremity of the sphenoid, along the posterior edge of the palatine floor, thus making of the inner nostrils a circumscribed aperture. Sphenoid teeth forming two elongated patches. Tongue large, elliptical,

attached by an elongated central pedicle, and free upon its posterior third. Eyes large. Limbs slender; anterior ones, longest; four fingers; five toes, all free, tapering. Tail subcylindrical, slightly compressed, tapering towards the tip. Skin, exteriorly smooth and soft.

SYN.—*Heredia*, GRD. Proc. Acad. Nat. Sci. Philad. VIII, 1856, 140.

OBSERV.—No genera are more alike in their external aspect than *Heredia* and *Anaides*. To distinguish them we must have recourse to the anatomy of the buccal cavity, although, one might recognize them on a profile view of the head, where the cleft of the mouth would become an important feature.

HEREDIA OREGONENSIS, Girard.

(Plate I, figs. 18–25.)

CAR. SPEC.—*Plicatura subcollo nulla. Cauda subcylindrica, gradatim minuente, quam corpus et caput simul sumpta longiore. Palmarum et plantarum digitis tenuibus et distinctis, interioribus perparvis. Cute lævi. Colore supra fusco; infra clariore.*

SPEC. CHAR.—No fold of the skin under the neck. Tail, subcylindrical, tapering, longer than the body and head together. Fingers and toes slender and free; inner one very small. Skin, smooth. Color uniform dark-brown above, lighter beneath.

SYN.—*Heredia oregonensis*, GRD. Proc. Acad. Nat. Sci. Philad. VIII, 1856, 141. —HALLOW. Proc. Acad. Nat. Sci. Philad. VIII, 1856, 235.

DESCR.—In its general physiognomy this species resembles strikingly, *Anaides lugubris*. It has the same general shape of the head, neck, body, and limbs; but the callous termination of the toes is much less developed.

The head is quite prominent, depressed; its upper surface subconcave; elliptical in outline, when seen from above. The snout is thick and subtruncated, overlapping the lower jaw. The nostrils are

lateral and nearly terminal. The eyes are prominent, subcircular; the distance between their anterior rim and the extremity of the snout is a little more than one of their diameter. The cleft of the mouth is uniformly curved, and not undulating as in *Anaides lugubris;* its angles extend almost to a vertical line drawn across the posterior rim of the orbit. The maxillary teeth are very minute, almost invisible to the naked eye. The palatine teeth are small, and disposed upon two open curves, one on each side, extending from the medial line of the palate almost to the jaw bone, leaving the inner nostrils in advance of them. The sphenoid teeth are very minute; disposed upon a double patch. The tongue is proportionally large, elliptical; adhering along its medial line, and free on the sides, as also posteriorly.

The neck is very distinct from the head and body. There is no gular fold. The body itself is subcylindrical; diminishing anteriorly as well as posteriorly; it is not plicated or folded laterally, though the specimens exhibit vertical lines corresponding to the ribs. The tail is subcylindrical; rounded above and below; a little longer than the body and head together; very much tapering, and terminating into a point.

The anterior and posterior limbs are of equal length; but the latter are stouter, and when bent in an opposite direction, alongside the body, they overlap each other the whole length of the carpus and tarsus, including the toes. The inner toe, in both pair of limbs, is quite small; in the anterior pair, the third is the longest; the second is a little shorter than the latter, and the fourth, a little longer than the first or inner one. The longest toe, in the posterior limbs, is the third likewise; the fourth being nearly equal to it; whilst the second is a little longer than the fourth, which itself is a little more developed than the first or innermost.

The skin is perfectly smooth externally; but, on being examined under the microscope, it exhibits a meshwork of little stellated bodies similar to those of *Anaides lugubris,* but proportionally larger.

According to a sketch from life, made by Mr. Drayton, the ground color is milky-white, with crowded dots of reddish-brown. On the specimens preserved in alcohol, however, the body, head, and limbs are of a uniform dark-brown; lighter beneath. Under a low magnifying power minute dots may be observed scattered all over the surface.

Loc.—This species was collected at Discovery Harbor, Puget Sound (Oregon), in May, 1841.

Plate I, fig. 18, represents *Heredia oregonensis*, size of life.

Fig. 19, exhibits the under surface of the same animal.

Fig. 20, the head, viewed from above, showing the interocular space.

Fig. 21, a profile of the head, exhibiting the gape of the mouth.

Fig. 22, front view of the head, showing the situation of the nostrils.

Fig. 23, inferior floor of the mouth, and outline of the tongue.

Fig. 24, the upper floor of the mouth, with the inner nostrils and disposition of its teeth.

Fig. 25, a fragment of skin, somewhat magnified, though not sufficiently to exhibit the stellated shape of the little bodies it contains.

Genus XIPHONURA, Tsch.

Gen. Char.—Head large, very much depressed; its upper surface convex. Vomerine teeth disposed upon a continued transverse series, behind the inner nostrils; no teeth on the sphenoid bone. Maxillary teeth quite small, conical, and acute. Tongue large, broad; attached by most of its under surface, leaving only the edges free. Feet proportionally stout and large. Toes rather short, broad, and subpalmate or free; callous at their tips. Tail elongated, much compressed, and ensiform; about the same length as the body. Skin densely studded with minute granules.

Syn.—*Xiphonura*, Tsch. in Mém. Soc. Sci. nat. Neuch. II, 1838, 95.—Gray, Catal. Amph. Brit. Mus. II, 1850, 34.—Dum. & Bibr. Erpét. gén. IX, 1854, 161.

Observ.—It has been deemed expedient to distinguish generically from *Amblystoma*, in accordance with Tschudi and Gray, such species, the tail of which is very compressed, and the skin granular; adding to these characters, a larger tongue and stouter limbs.

Besides the species hereinafter described, there is another belonging to the genus *Xiphonura*, inhabiting the eastern range of the United States, *Xiphonura jeffersoniana:* the *Salamandra jeffersoniana* of Green, or *Triton niger* of Dekay.

We are inclined to think that *Triton ensatus*, from California, described in Eschscholtz's "Zoologischer Atlas," V, 1833, page 6, and figured on Plate XXII of the same work, will constitute a third species of this genus.

XIPHONURA TENEBROSA, Grd.

(Plate I, figs. 9–17.)

CHAR. SPEC.—*Capite valde amplo et depresso. Cauda valde compressa et corporis longitudinem adequante. Digitis palmarum plantarumque elongatis, complanatis. Cute densa et inconspicue granulata. Supra rubro-fusca, maculis nigro-fuscis interspersis; infra unicolori.*

SPEC. CHAR.—Head very broad and flat. Tail very much compressed, equal to the body in length. Fingers and toes rather long and flattened. Skin densely and inconspicuously granular. Color, dark reddish-brown above, spotted with deeper brown; beneath, unicolor.

SYN.—*Amblystoma tenebrosum*, B. & G. Proc. Acad. Nat. Sci. Philad. VI, 1852, 174.

DESCR.—The head forms about the sixth of the entire length; it is proportionally large, and well detached from the body; depressed and subconcave superiorly; viewed from above, its shape is ovoidal, narrowest forwards. The snout is rounded; the nostrils are situated high up on the sides, a little more distant from the anterior rim of the orbit than the extremity of the snout. The eyes are of medium size; their anterior margin is one and a half of their diameter distant from the extremity of the snout. The mouth is broadly cleft. The maxillary teeth are proportionally small, acute, and conical; disposed upon one row; somewhat more conspicuous on the lower than on the upper jaw. The vomero-palatine teeth constitute a gently undulating and transverse band, extending from the exterior edge of the inner nostrils to the middle line of the vomer, where the bands from either side meet, without being, however, in immediate contiguity. The sphenoid is entirely deprived of teeth. The inner nostrils themselves are broadly open and far apart. The tongue is very large, broad, attached by most of its under surface; its lateral margins alone being free and slightly also anteriorly.

The neck is almost continuous with the body; whilst the head is rather detached from it, owing to the development of the temporal region. A double gular fold may be observed. The body itself is

subcylindrical. The tail is as long as the body, the head excluded; it is compressed, subquadrangular upon its anterior third, very thin posteriorly, with the upper and lower edges quite sharp, and tapering into a point.

The limbs are well developed; the posterior ones are longer and much stouter than the anterior. In bringing the latter backwards and the former forwards alongside the body, the fingers and toes overlap each other. The digits are free, rather long and depressed. The first or inner finger is somewhat shorter than the fourth or outermost; the second and third are the longest, and nearly equal in length. The inner toe is the smallest; the fifth is a little shorter than the second; the third is the longest; the fourth is somewhat shorter than the third.

The skin, though apparently smooth, is minutely and inconspicuously granular to the touch, and when examined under the microscope, it is found to contain a dense system of rounded granules, perhaps glands, of various size.

The ground color is dark-reddish or chestnut-brown. The upper surface of the head and body is maculated with small, irregular, black spots. Minute yellowish dots are observed on the back, sides, belly, inferior surface of the head and tail, and which seem to correspond to the granules of the skin.

Loc.—The specimen figured and described was collected in Oregon.

Plate I, fig. 9, represents *Xiphonura tenebrosa*, size of life.
Fig. 10, is the under surface of the same animal.
Fig. 11, the head, seen from above, showing the interocular space.
Fig. 12, a profile of the head, exhibiting the gape of the mouth.
Fig. 13, front view of the head, and situation of the nostrils.
Fig. 14, inferior floor of the mouth, and outline of the tongue.
Fig. 15, the upper floor of the mouth, with the inner nostrils and the disposition of the vomero-palatine teeth.
Fig. 16, a fragment of the skin, taken on the dorsal region; and
Fig. 17, a portion of the skin, taken on the abdominal region.
Figs. 16 and 17, being somewhat magnified.

Tribus II. BATRACHIA ANURA.

Body short and thickish, without tail when adult. Head broad, depressed. Lower jaw toothless. Eyes provided with an upper and a lower lid. Tongue fleshy, either adhering by its entire under surface, else more or less free posteriorly. Two pairs of limbs; posterior ones longest. Skin naked or else scaleless, either smooth or warty. No external auricular aperture, but oftentimes a tympanic membrane. Vent round and terminal.

Syn.—*Anoures*, Dum. Zool. anal. 1806.—Dum. & Bibr. Erpét. gén. VIII, 1841, 291.
Anura, Fitz. Syst. Rept. 1, 1843, 34.

Observ.—The tailless Batrachians constitute a very natural group, and easily distinguished from the caudate tribe, not merely because the tail is absent in their full-grown state, but chiefly also by a shorter and more compact body, more developed legs, especially the posterior pair, which are adapted to the jump. When teeth exist upon the jaws, they are found upon the upper jaw, never upon the lower one, which is always toothless. Again, vomerine teeth are not constantly met with, and as to sphenoid teeth, they are not known in this group.

Fam. RANIDAE.

Teeth to the upper jaw, and on the vomer also. Tongue oftentimes bifurcated posteriorly. No parotid glands. Extremities of fingers and toes tapering. Abdomen smooth.

Syn.—*Ranidae*, Bonap. Saggio Distr. metod. Anim. vertebr. 1831, 83.
Raniformes, Dum. & Bibr. Erpét. gén. VIII, 1841, 317.

Observ.—It will always be easy to distinguish the frogs from the toads, by the presence of teeth to the upper jaw as well as on the vomer. This family is not to be so widely separated from the tree-frogs, as observed further on.

In revising the genera established by various authors,* we have concluded to adopt *Leptodactylus*, *Cystignathus*, *Pleurodema*, and *Crinia*, and to institute several others under the appellation of *Ranidella*, *Wagleria*, and *Kassina*, two of which (*Crinia* and *Kassina*), had no representatives in the collection made by the Exploring Expedition.

But, as *Crinia* is intimately related to *Ranidella*, it will be expected that we should recall the characters by which we propose to distinguish it as a genus. They are the following:

CRINIA, Tsch. Vomerine teeth few, constituting two groups, situated at the posterior margin of the inner nostrils. Tongue entire; oblong in shape. Tympanum inconspicuous. Eustachian tubes small. Fingers and toes not palmated.

SYN.—*Crinia*, TSCH. in Mém. Soc. Sc. nat. Neuch. II, 1838, 78.—GRD. in Proc. Acad. Nat. Sci. Philad. VI, 1853, 420.

So far but one species of this genus has come to our knowledge, *Crinia georgiana*, Tsch., a native of Australia.

GENUS RANA, LINN.

GEN. CHAR.—Teeth on the upper jaw. Vomerine teeth situated between the inner nostrils. Tongue broad, oblong, narrowest anteriorly, bifurcated posteriorly, and free upon the posterior third of its length. Tympanum distinct. Openings of Eustachian tubes varying in size, according to the species. Fingers and toes subcircular; the fingers always free; the toes more or less palmated. Processus of the first cuneiform bone, obtuse. Transverse apophysis of the sacral vertebra not dilated into pallets. Two internal or external vocal bladders or sacs in the males.

SYN.—*Rana*, LINN. Syst. Nat. ed. VI², 1748.—DUM & B. Erp. gén. VIII, 1841, 335.

OBSERV.—This genus, as here characterized, is restricted within narrower limits than in the "Erpétologie générale."

* Proc. Acad. Nat. Sci. Philad. VI, 1853, 420.

1. Rana aurora, B. & G.

(Plate II, figs. 1–6.)

Car. spec.—*Dentibus vomerinis minutis, parum numerosis, in duos acervos oblongos oblique inter interiores nares et paulo post illas dispositis. Lingua parva. Tympano modico. Palmis plantisque planis; palmarum digitis elongatis. Ultimo plantarum digitorum articulo libero. Parvum corneum tuberculum in plantarum digiti base apparet. Cute lævi, minutissime porosa. Plicatura dorsali glandulari in utroque latere.*

Spec. Char.—Vomerine teeth minute, few in number, disposed upon two oblong groups, obliquely situated between and a little behind the inner nostrils. Tongue small. Tympanum of medium size. Hands and feet underneath smooth; fingers elongated. Terminal joint of toes free; a small horny tubercle at the base of the inner toe. Skin smooth, minutely porous. Two dorsal glandular folds, one on each side. Ground color above greenish-yellow, with golden reflections, maculated with black. A dark area behind the eye; a yellow line along the upper jaw. Sides of abdomen and hind legs reddish-orange; beneath dull-yellowish, maculated. Digital membrane purplish-violet.

Syn.—*Rana aurora*, B. & G. Proc. Acad. Nat. Sci. Philad. VI, 1852, 174.

Descr.—The head is very much depressed, broader than long, and even upon its upper surface. The snout is subconical, protruding beyond the lower jaw, and declivous from the nostrils to its tip. The canthus rostralis is even with the surface of the snout. The nostrils themselves are elongated, and situated at the upper part of the lateral declivity of the snout, half way between the anterior margin of the eye and the extremity of the muzzle; the membranous flap which exists upon their posterior edge is thickened into a minute knob, lying in a little depression. The eyes are moderate in size, and circular, with the iris black. The margin of the upper lid is quite thin, and exhibits several folds, one anteriorly, the others posteriorly. The

tympanum is subcircular; its diameter being a little smaller than that of the eye, and contained once and a half between the orbit and the extremity of the snout. The mouth is very large; the upper jaw being emarginated, and the tongue oblong, narrow, and moderately forked. The inner nostrils are conspicuous and transversely elongated. The vomerine teeth, situated between and somewhat behind the latter, constitute two elliptical groups, inclined sideways. The openings of the tubes of Eustachi are subcircular and proportionally large.

The body itself is elongated and depressed. The limbs are long and slender, especially the hind ones, which are longer than the body and head together, measured from their origin to the base of the tarsus. The feet themselves are as long as the thighs. The fingers are long and stout; the innermost, or thumb, is a little longer than the second, which is the shortest; the outermost is about the same length with the first. Their terminal phalanx is knob-shaped beneath, resembling in that respect the tubercles which may be observed under the articulations of the phalanges. The palm of the hand is smooth; two elongated and flattened horny disks may be seen upon its base, large, though not prominent. The interdigital membrane is deeply concave between the toes, and does not quite reach their tips. Tubercles are observed under the articulations of the phalanges. The tarsus beneath is perfectly smooth, and provided only with a small horny process at the base and outer edge of the first toe.

The skin is smooth all over the body and limbs, above and below. Two longitudinal zones of minute pores may be seen extending from behind the orbits, immediately above the tympanum, to near the posterior region of the body.

The color above is greenish-yellow, with golden reflections along the upper jaw, dorsal region, and on the limbs. Two dorsal black bands extend over the series of pores. A narrow black vitta exists on the line of the canthus rostralis, between the nostrils and the eye, and another along the upper and posterior margin of the tympanum. The sides of the abdomen, and sides of the legs also, are reddish-orange. Black spots and dots are scattered all over the body, head, and limbs, largest posteriorly. The upper lid, the snout, and the edge of the upper jaw are dotted with black. The iris is golden. The membrane uniting the toes is purplish or violet. Beneath, dull yellowish-green, maculated with blackish on the inferior surface of the head, from the

extremity of the lower jaw to the middle of the abdomen. The limbs underneath show similar traces of maculæ.

Specimens of this species were collected on Puget's Sound, Oregon, in May, 1841.

We consider as belonging to the same species, a dozen of immature individuals, collected on Columbia River, Oregon.

Plate II, fig. 1, represents *Rana aurora*, size of life, and in profile.
Fig. 2, is a profile of the head.
Fig. 3, an outline of the head, seen from above.
Fig. 4, an outline of the same region, from beneath.
Fig. 5, under surface of the right hand.
Fig. 6, under surface of the right foot.

2. Rana pretiosa, B. & G.

(Plate II, figs. 13–18.)

Car. spec.—*Tympano parvo. Palmis planis. Plantis granulatis. Palmarum digitis gracilibus et gradatim minuentibus. Plantarum digitis palmatis; longissimi solummodo terminali articulo libero. Parvo planoque corneo processu in interioris digiti base; minuto, conicali, metatarsali tuberculo, inter quartum et quintum digitum. Cute scortea, minutis granulis in anteriori, majoribus in posteriori dorsi parte, et in abdominis lateribus, coöperta. Dorsali pororum serie in utroque latere. Glandulari carina per longitudinem maxillæ superioris.*

Spec. Char.—Tympanum rather small. Hands smooth. Feet underneath granulated. Fingers slender and tapering. Toes webbed; terminal joint of longest one alone free. A small and flattened horny process at the base of the inner toe, and a minute, conical, metatarsal tubercle between the fourth and fifth toes. Skin leathery, finely granular on the anterior portion of the back; more coarsely so posteriorly, and on the sides of the abdomen. Two depressed dorsal

series of pores, one on each side. A glandular ridge along the upper jaw.

Syn.—*Rana pretiosa*, B. & G. Proc. Acad. Nat. Sci. Philad. VI, 1853, 378.

Observ.—The chief feature, which will at once distinguish this species from the preceding one, consists in its much shorter limbs, especially the hind ones, together with the membrane of the feet which extends to the very tip of the toes. The granulation of the body and inferior surface of the feet, are other external characters which may assist in distinguishing it from *Rana aurora*. The groups of vomerine teeth approximate also closer together, and the tongue is free upon a greater extent than in the latter species.

Descr.—The head is a little broader posteriorly than long; its upper surface is subconcave. The snout is rounded, less prominent than in *R. aurora*, and declivous on each side. The nostrils, which are situated towards its upper surface, are elliptical in shape, and placed midway between the extremity of the snout and the anterior rim of the orbit. Immediately behind the nostrils may be observed a little depression, into which fits a mammelliform tubercle, attached to the membranes passing over the nostrils themselves. The eyes are large and subcircular, and greater in diameter than half the distance between them and the tip of the snout. The tympanum is subcircular and smaller in diameter than the eye. The mouth is broad; the tongue large and subcordiform, broadest posteriorly, deeply emarginated, and free upon the half of its length. The maxillary teeth are very small; inconspicuous though acute. The vomerine teeth constitute two oblong groups, situated between and a little behind the inner nostrils, nearer the latter and closer to one another, than in *R. aurora*. The inner nostrils themselves are transversely oblong, rather small, whilst the tubes of Eustachi are quite large, and, therefore, more conspicuous.

The body is rather short, and subcylindrical in shape. The legs, as already stated, are proportionally much smaller than in *R. aurora*, whilst the fingers are longer, more slender, and tapering. The inner one is very fleshy upon its origin; it is longer than the second, and shorter than the third, which is the longest; the fourth, or outermost, is slightly longer than the second. Two horny protuberances are

seen at the base of the carpus; they are quite flattened and not very apparent. The palm of the hand exhibits two horny disks, otherwise it is smooth; small tubercles exist under the articulations of the fingers. The feet are very broad, proportionally broader than in *R. aurora*. The membrane which unites the toes extends to their very tip, forming a very open curve between each of them. The fourth, or longest toe alone, stretches a little way beyond the edge of the web. Small, but conspicuous tubercles, are observed under each digital articulation; besides, there are very small granules along the toes and all over the tarsus. A compressed horny tubercle is to be observed at the base and outer edge of the inner toe, and a very small and conical one at the base of the longest or fourth. The skin, at first sight, appears smooth, but, on a careful examination, granules will be found on the upper part of the head, down the back and sides, and over the limbs; more developed, however, posteriorly, on the region of the coccyx and thighs. It is the same granulation which we have noticed under the feet. The inferior surface of the head, belly, and inner side of the legs, is perfectly smooth.

The upper surface of the head and snout exhibits small black spots. A black line extends from the nostrils to the eyes, and from the posterior rim of the orbit to near the shoulder, exists an elongated, posteriorly tapering, deep-brown band, margined with black, and covering entirely the tympanum, such as may be observed in *Rana temporaria* of Europe, and *Rana sylvatica* of the United States.

The upper region of the body and limbs is yellowish-brown; irregularly rounded black blotches and dots may be seen along the dorsal region between the glandulous ridges; these series or zones are themselves of a lighter hue, lined above and below with irregular black dots. The sides of the abdomen are greenish-brown or dusky. The upper surface of the limbs are blotched in the same manner as the back, more conspicuously upon the hind ones. The color beneath is dull yellowish-white, marmorated anteriorly with brown.

In the immature state the dorsal blotches are very distinctly marked, subcircular or oblong, forming three irregular series, on a ground color that has much less of the red than in the adult. Beneath of a soiled white. The granulation of the skin is as strongly marked as in the adult.

The color, as described here in the young as well as in the adult, is taken from specimens preserved in alcohol, no sketch having been made from life.

All the specimens of this species were collected on Puget's Sound, Oregon.

Plate II, fig. 13, represents *Rana pretiosa*, size of life.
Fig. 14, a profile view of the head.
Fig. 15, the head, seen from above.
Fig. 16, the head, from beneath.
Fig. 17, under surface of the left hand.
Fig. 18, under surface of the left foot.

3. Rana draytoni, B. & G.

(Plate II, figs. 19–24.)

Car. spec.—*Tympano oblongo et amplo. Palmis et plantis planis; digitis palmarum robustis. Cruribus permagnis. Femori et tibia tantummodo non æqualibus, et dimidiam corporis longitudinem fere attingentibus. Plantarum digitis ad articulum terminalem usque palmatis. Oblongo et corneo processu in base primi plantarum digiti, nec non tuberculo circulari et rudimentari in base tarsi ex adverso longissimi plantarum digiti. Cute supra minutissime granulata. Plicatura glandulari super oris angulum, et ampla carina in utroque latere.*

Spec. Char.—Tympanum oblong and rather large. Hands and feet underneath smooth; fingers stoutish. Legs very large. Femur and tibia nearly equal, about half the length of the body. Toes webbed to the terminal joints. An oblong horny process at the base of the first toe, and a round rudimentary tubercle at the base of the tarsus, opposite the longest toe. Skin finely granular above. A glandular fold above the angle of the mouth, and a broad ridge on each side.

Syn.—*Rana draytonii*, B. & G. Proc. Acad. Nat. Sci. Philad. VI, 1852, 174.

Observ.—By its hind legs this species is intermediate between *R. aurora* and *R. pretiosa*, since these organs are very much developed, as is the case in the former, and the toes webbed almost to their tips, as in the latter.

Descr.—The head is proportionally large; flattened above and declivous on the sides. The snout is subtruncated; thicker than in both *R. aurora* and *R. pretiosa*. The length of the head is equal to its width; seen from above, its shape is subtriangular. The nostrils are oblong and situated obliquely near the upper part of the snout, nearer to its tip than to the anterior margin of the eye. The eyes themselves are quite large; their diameter is nearly equal to the distance between their anterior margin and the extremity of the snout. The upper lid is anteriorly and posteriorly folded, more conspicuously posteriorly. The tympanum is circular or subcircular; smaller than the eye; equal in diameter to the distance between the orbit and the nostrils. The tongue is thick, oblong, and elongated; free upon its posterior third. The groups of vomerine teeth are very conspicuous, oblong; situated obliquely between the inner nostrils and the medial line of the palate. The inner nostrils themselves are comparatively small, transversely elongated. The openings of the tubes of Eustachi are subcircular, and slightly larger than the inner nostrils.

The body is a little more than twice the length of the head, and attenuated posteriorly. The anterior limbs and fingers are rather stout, the latter swollen at their tip, instead of being pointed, as in *R. pretiosa*. The carpus, beneath, is smooth; two flattened and elongated, quite large disks, may be seen at its base. The first finger is very much swollen upon its first half, and conspicuously longer than the second, which is the shortest; the third is the longest, and the fourth about the length of the first. Round and stout tubercles exist under each digital articulation. The hind limbs are longer than twice the length of the body, the head excepted. The tibia being itself longer than the femur. The toes are subcircular and webbed to almost their very tip, which is swollen in the same manner as the fingers. An oblong and large tubercle may be observed exteriorly at the base of the first toe, and a small rounded one at the base of the fourth or longest toe. Large tubercles exist under the articulations, and very minute granules under the metatarsus.

The skin above is apparently smooth, but, on examining it with a somewhat magnifying power, it is found to be densely studded with minute warts and granules of various magnitude, extending over the head as far as the nostrils. Beneath, the skin is perfectly smooth, except the posterior portion of the thighs, which is covered by a pavement of irregularly polygonal glands.

The ground color is olivaceous; the body and limbs above, maculated with large brownish-black blotches, the latter much larger on the hind legs; the whole surface, from the snout to the tips of the fingers and toes, is minutely dotted. The glandulous dorsal ridges appear almost black by the accumulation of small spots and dots. Faint traces of a narrow stripe exist between the eyes and the nostrils. The belly is unicolor; the margin of the lower jaw and the hind legs being inconspicuously maculated.

Loc.—This species is a native of California.

Plate II, fig. 19, represents *Rana draytoni*, size of life.
Fig. 20, is the head, viewed in profile.
Fig. 21, the head, seen from above.
Fig. 22, the head, seen from beneath.
Fig. 23, under surface of left hand.
Fig. 24, under surface of left foot.

4. Rana maritima, Risso.

(Plate II, figs. 7–12.)

Spec. Char.—Diameter of tympanum nearly equal to the width of the upper lid. Interocular space narrow. Interdigital membrane deeply emarginated. Two glandular dorsal ridges; one on each side. Body above covered with small pustules, largest upon the middle of the back.

Syn —*Rana maritima*, Risso, Hist. nat. Europ. mérid. III. 1826, 92.

Observ.—In recording this species as distinct from *Rana viridis*, with which it has been identified by Duméril and Bibron, and from *Rana temporaria*, which it was labelled by the scientific corps of the United States Exploring Expedition, we consider it our duty to state that we are not yet fully satisfied of its real identity with Risso's species. As it is, however, the one to which it comes nearest, we have not deemed it expedient to multiply the names, already so numerous, which have been bestowed upon European frogs. Risso

only describes the coloration of his species, failing to point out the organic characters by which it could be distinguished from either *Rana viridis*, *Rana esculenta*, and *Rana temporaria*. But as far as the description of that author goes, it will apply almost strictly to the specimens now before us.

We regret not having at our disposal sufficient materials to institute a thorough comparison between this species and *Rana viridis* and *Rana temporaria*. Taking the work of the French herpetologists just mentioned, for our guidance, we find that it differs from *Rana viridis*, in having the vomerine teeth disposed upon two groups, instead of forming a transverse row. That it differs further from the latter by a snout more truncated, which brings the nostrils nearer to the end of the snout than the anterior rim of the orbit; by the interocular space, which is proportionally smaller; by the diameter of the tympanum, which is smaller that that of the eye; by the tip of the fingers and toes, which are slightly swollen, instead of being tapering; by the toes themselves, which are rather depressed, whilst they are said to be cylindrical in *Rana viridis*.

Again, it differs from *Rana temporaria* by the position of the groups of vomerine teeth, which in *Rana temporaria* are situated more posteriorly with regard to the inner nostrils. It differs further from the latter in having the fourth toe but one-fourth longer than the third, and the fifth similar to that of *Rana viridis*. The tympanum is a little more than half the length of the upper lid, whilst in *Rana temporaria* it is three-fourths of that same length, and instead of being smooth as in the latter, it is posteriorly folded as in *Rana viridis*. The interocular space, finally, is much broader in *Rana temporaria* than in *Rana maritima*.

With such a state of things, we have considered it important to the progress of science to give such figures as the state of preservation of specimens would allow, accompanied by such a description as may enable future observers to establish a more thorough comparison between it and the species they may be called upon to study and describe.

Descr.—The head is subtriangular, broader than long, anteriorly subtruncated, rounded from the nostrils to the margin of the upper jaw. The nostrils themselves are situated near the upper surface of the snout, and nearer its extremity than the anterior rim of the orbit. They are elongated, resembling a depressed ellipsis, obliquely placed

upon the snout; their membrane, posteriorly, is provided with a very small knob. The sides of the snout, behind and somewhat below the nostrils, are slightly depressed or subconcave. The eyes are large and prominent; their diameter is almost equal to the distance between their anterior margin and the extremity of the snout. The tympanum is subcircular; its diameter being equal to the distance extending from the eyes to the nostrils. The tongue is large. The vomerine groups of teeth are placed exactly between the inner nostrils, a little nearer the latter than they are to each other upon the medial line. The inner nostrils themselves are very conspicuous, subelliptical, one-third smaller than the openings of the Eustachian tubes, which are subcircular.

The body is subcylindrical; the dorsal region depressed. The elbow and knees overlap each other considerably, when brought along the side of the abdomen. The second and fourth fingers are equal in length, and shorter than the innermost; the fifth is the longest of all. They are subdepressed; swollen at the tip, and provided under each articulation with a somewhat conspicuous tubercle. Two contiguous and flattened disks are observed at the base of the carpus, which otherwise is smooth. The toes, like the fingers, are slightly swollen upon their tips, and provided underneath with tubercles corresponding to each articulation. The under surface of the tarsus is finely reticulated; a flattened tubercle exists exteriorly to the base of the first toe, and a small circular rudimentary one at the base of the fifth. The membrane uniting the toes is deeply emarginated between each digit. The membrane appears to extend to the middle of the last phalanx, except in the case of the fourth or longest toe, where almost two phalanges may be seen projecting beyond that membrane.

The snout is perfectly smooth. The space between the eyes and the eyelids above, appear as if finely reticulated, especially the latter. The glandulous ridges on each side of the back are variable in width. The dorsal space between these ridges is irregularly spread over with tubercles, varying in size, none of which being very large; the skin there presents the same appearance as the surface of the glandulous ridge, and the upper inner half of the eyelid. The sides of the abdomen are minutely glandulous, as also the upper portion of the legs. A very narrow glandulous ridge may be observed immediately above the tympanum detaching itself from the dorsal one, and descending obliquely towards the shoulders, where it meets a transverse glandulous and thicker ridge, extending from the angle of the mouth beyond

the insertion of the fore-limbs. Beneath, the posterior half of the abdomen and thighs are glandulous, whilst the anterior half appears rather smooth. The lower jaw is finely reticulated.

The ground color, as preserved in alcohol, is greenish-brown. One large specimen reflects a rather reddish tint on the upper regions. There is a dorsal lighter vitta, on each side of which there being extant a series of large deep brownish-black spots, few in number. Another series of similar, but smaller spots, is occasionally seen on the sides beneath the glandulous ridges, and alternating with the dorsal series: a few spots on the fore and hind legs, assuming upon the latter the shape of transverse bars. A narrow black vitta extends from the tip of the snout across the nostrils to the eye. The margin of both jaws is maculated. An elongated spot is observed at the angle of the mouth. A black stripe along the forearm, anteriorly. Lower portion of sides, yellow, vermiculated, and spotted with deep black. An irregular longitudinal black band along the anterior margin of the hind limbs. Beneath, dull yellowish, maculated or vermiculated with brown or black.

Loc.—Specimens of this species were collected on the Island of Madeira.

Plate II, fig. 7, represents *Rana maritima*, size of life.
Fig. 8, a side view of the head.
Fig. 9, the head, seen from above.
Fig. 10, the head, seen from beneath.
Fig. 11, under surface of the left hand.
Fig. 12, under surface of the left foot.

Genus LEPTODACTYLUS, Fitz.

Gen. Char.—Vomerine teeth disposed upon two transverse series, each of which constituting either an angular arch, or a regular curve, and situated behind the inner nostrils. Tongue slightly notched posteriorly. Tympanum very conspicuous. Toes long and slender; either provided with a basal rudimentary membrane, or entirely free.

Syn.—*Leptodactylus*, Fitz. N. Class. Rept. 1826, 64.—Grd. in Proc. Acad. Nat. Sci. Philad. VI, 1853, 420.

OBSERV.—Besides the species described below, the genus *Leptodactylus* will include *Rana labyrinthica* of Spix, and likewise *Rana typhonia*, the affinities of which were already known to Fitzinger himself.

1. LEPTODACTYLUS OCELLATUS, Grd.

(Plate III, figs. 1–6.)

CHAR. SPEC.—Vomerine teeth disposed upon angular arches. Tongue cordiform, free posteriorly upon one-third of its length, and slightly emarginated at both extremities. Toes with a rudimentary, basal, and marginal membrane. Skin with indistinct longitudinal dorsal folds; otherwise, smooth. Greenish-brown on the head and back; yellowish-brown on the sides and legs, with series of black maculæ. A post-orbital vitta tapering to a point towards the axilla. Margin of the jaws maculated with black and white.

SYN.—*Rana ocellata*, LINN. Mus. Adolph. Friedr. II, 39; Syst. Nat. ed. X^a^ I, 1758, 211, et ed. XII^a^ I, 356.—GM. *Linn.* Syst. Nat. ed. XIII^a^ III, 1793, 1052.—SCHN. Hist. Amph. I, 1799, 116.—SHAW, Gen. Zool. III, 1802, 108, Pl. 34.—DAUD. Hist. Nat. Rain. Gren. Crap. 1803, 61, Pl. XIX; Hist. Nat. Rept. VIII, 1804, 118.—MERR. Tent. Syst. Amph. 1820, 176.—FITZ. N. Class. Rept. 1826, 64.—GRAY. Delic. Mus. Zool. Vratislav. Batr. 1829, 42.

Leptodactylus serialis, GRD. in Proc. Acad. Nat. Sci. Philad. VI, 1853, 421.

OBSERV.—We have not referred to all the synonyms of this species as given in the "Erpétologie générale," since we are not satisfied of their identity. In making the above selections, our purpose is to call the attention upon this subject.

DESCR.—The head is elongated, longer than broad, depressed, and when seen from above, ovoid in its outline; the snout being perfectly round. Its upper surface is even, slightly sloping. The phrenic region is subconcave laterally; the canthus rostralis being almost level with the upper surface of the snout. The nostrils are much nearer the margin of the upper jaw than the anterior rim of the eyes: they are comparatively small and subcircular. The eyes are of medium size, subcircular; their diameter being equal to the distance between them and the nostrils. The upper lid is quite smooth, very thin upon its margin, and projecting considerably over the eyeball. The width of the interocular space is smaller than the diameter of the

eye, of about one-third, consequently narrower than the upper lid. The tympanum is subcircular, very conspicuous, situated above the angle of the mouth. Its diameter is equal to the interocular space, that is to say, considerably smaller than the eye. The mouth is deeply cleft. The tongue is cordiform, narrowest anteriorly, and slightly emarginated at both extremities, the posterior one of which being free for about one-third of the length of that organ. The inner nostrils are quite large; irregularly and transversely oblong. The vomerine teeth are placed behind the latter; the arches which they constitute are almost contiguous and angular, instead of forming an open curve, as in the following species. The openings for the Eustachian tubes are as large as the inner nostrils, and irregular also in their outlines.

The body is raniform, elongated. The legs are proportionally well developed; the anterior ones, when brought backwards alongside the body, extend beyond the groins, for the whole length of the fingers: these are subcylindrical and tapering, the first being longer than the second. They are provided under their articulations with small conical tubercles. The palm of the hand is subtuberculous. There are two metacarpal horny disks, the innermost oblong, and situated at the base of the first finger. The hind legs are longer than the body and head together, for the whole length of the feet. A membranous fold may be seen lining the inner edge of the tarsus. There are two metatarsal tubercles, the outer one quite small and conical, the other is more elongated, and placed interiorly at the base of the first toe. The toes themselves are slender, tapering to a point, and free, save a rudimentary membrane at their base, and an indistinct fold along their edge. The sole of the feet is smooth. Conspicuous tubercles are observed under each of the articulations of the toes.

The skin is smooth; there are four longitudinal narrow ridges on each side of the back, exhibiting, however, no roughness about them.

The ground color of the head and back is greenish-brown; on the sides and upper part of legs, yellowish-brown. A blackish vitta is observed on each side of the snout, along the line of the canthus rostralis; behind the eyes the said vitta widens and passes around the tympanum, hence, tapering towards the shoulder. The margin of the jaws is spotted black and white. A large subtriangular patch upon the eyelid. The tympanum is deep-chestnut, margined with dull-yellow. Series of small black spots may be seen along the back, between the cutaneous ridges, the exterior one of which being whitish,

the others partaking of the hue of the region to which they belong. The fore legs exhibit a series of black spots upon both their anterior and posterior surface, united on the arm properly so called, whilst on the hind legs these series of spots assume a transverse aspect. The posterior portion of the thighs is vermiculated. Beneath, the color is of a uniform dull-yellow.

Specimens were collected at Rio de Janeiro, in 1839, when a drawing from life was made by Mr. Drayton.

Plate III, fig. 1, represents *Leptodactylus ocellatus*, size of life.
Fig. 2, is a side view of the head.
Fig. 3, the head, seen from above.
Fig. 4, the head, seen from beneath.
Fig. 5, under surface of right hand.
Fig. 6, under surface of left foot.

2. Leptodactylus caliginosus, Grd.

Char. spec.—*Dentibus vomerinis in curvis regularibus dispositis. Lingua subelliptica, elongata, in duabus extremitatibus leviter incisa. Plantarum digitis, rudimentaria, basali, et marginali membranâ munitis. Cute lævi; juvenes in utroque dorsi latere plicaturas longitudinales exhibent. Colore rubro-fusco; supra maculis nigris obsoletis conspersis, in posterioribus cruribus conspicuoribus. Post-oculare vitta trans tympanum porrecta.*

Char. Spec.—Vomerine teeth disposed upon regular curves. Tongue subelliptical, elongated, slightly notched at both extremities. Toes with a rudimentary, basal, and marginal membrane. Skin smooth; traces of longitudinal dorsal folds in the young. Reddish-brown with obsolete blackish maculæ on the back, more conspicuous on the hind limbs. A subcordiform occipital spot. A postocular vitta stretching beyond the tympanum.

Syn.—*Leptodactylus caliginosus*, Grd. in Proc. Acad. Nat. Sci. Philad. VI, 1853, 422.

Descr.—This species is allied to the preceding one. Its head is conical when seen from above, depressed, as broad as long, constitu-

ting one-third of the whole length. The snout is rounded; its upper surface is smooth, and slightly sloping towards the snout. The phrenic region, laterally, is more depressed than in *Leptodactylus ocellatus*, thus causing the canthus rostralis to be more apparent. The nostrils are small, oblong, and nearer the margin of the upper jaw than the anterior rim of the eye. The eyes, themselves, are of medium size, subcircular; their diameter being equal to the distance between them and the nostrils. The upper lid is smooth; its exterior margin thin, but much less projecting over the eye than in *Leptodactylus ocellatus*. The interocular space is about equal to the width of the upper lid, but smaller than the diameter of the tympanum, and a little wider than the radius of the orbit. The tympanum itself is circular, very conspicuous; its diameter being about two-thirds that of the eye. The mouth is large, and the tongue, thickish, subelliptical, but slightly free posteriorly, and likewise slightly emarginated upon its extremities. The symphysis of the lower jaw is provided with a tubercle or knob fitting the anterior emargination of the tongue as also a depression in the upper jaw. The inner nostrils are subcircular, and of medium size. The vomerine teeth, situated behind the latter, constitute two regular arches, more distant from each other than in *Leptodactylus ocellatus*. The openings of the Eustachian tubes are very conspicuous, and longitudinally subelliptical.

The body is raniform, elongated, subcylindrical. The anterior legs are proportionally shorter than in *Leptodactylus ocellatus*, although the fingers project a little beyond the groins when bent backwards alongside the body. The first finger is much longer than the second, which is equal to the fourth. The fingers, themselves, are subcylindrical, tapering, and provided with small tubercles under the articulations of their phalanges. The palm of the hand is smooth; the external metacarpal disk is much less conspicuous than the internal one, which is quite developed and oblong-shaped. The hind legs have the same proportional development as in *Leptodactylus ocellatus;* they are longer than the body and head together, of the whole length of the feet. The thighs are much stouter than in *Leptodactylus ocellatus*. The tarsus is provided with a similar membranous fold along its inner edge. There is an outer, large, metatarsal, very much depressed disk, and a rather small tubercle at the base of the inner toe. The sole of the feet is smooth. The toes are subcylindrical, slender, tapering, and provided under their articulations with small tubercles.

A rudimentary membrane may be observed at their base, as also an inconspicuous fold along their margins.

The color is uniform reddish-brown, lighter beneath than above, with a light line along the middle region of the back and thighs.

This species was collected about Rio de Janeiro, Brazil, along with the preceding species.

Genus CYSTIGNATHUS, Wagl.

Gen. Char.—Vomerine teeth disposed upon a transverse or oblique row, more or less interrupted in the middle, and situated between the inner nostrils or behind them. Tongue circular, subcircular, or subcordiform; posteriorly entire and attached by its whole surface, or slightly free behind. Tympanum not always distinct. Toes moderate, bordered by a membranous fold, or inconspicuously webbed at their base.

Syn.—*Cystignathus*, Wagl. Nat. Syst. Amph. 1830, 202.—Grd. in Proc. Acad. Nat. Sci. Philad. VI, 1853, 420.

Observ.—*Cystignathus macroglossus*, Dum. & Bibr., from Montevideo; *C. gracilis*, Dum. & Bibr., from the same locality, and *C. roseus*, Dum. & Bibr., from Chile, will remain in the present genus.

1. Cystignathus nebulosus, Grd.

(Plate III, figs. 19–23.)

Car. spec.—*Dentibus vomerinis in duos acervos elongatos, oblique inter interiores nares, dispositis. Tympano inconspicuo. Plantarum digitis depressis, et plicaturâ membraneâ marginatis. Duo tuberculi in metatarso; in tarso verò, plicatura membranea. Glandulis lumbalis nullis. Cute minute granulata. Supra pallide fusco, albis punctulis consperso, colore rufulo obscurato. Macula subtriangulari nigro-fusca in occipite sita, atque post oculis vitta ejusdem coloris. Posterioribus cruribus rubro-fusco fasciatis. Infra unicolori.*

Spec. Char.—Vomerine teeth disposed upon two elongated groups, obliquely situated between the inner nostrils. Tympanum inconspicuous. Toes depressed, margined by a membranous fold. Two

metatarsal tubercles. A ridge along the inner side of the tarsus. No lumbar glands. Skin minutely granular. Above light-brown, dotted with white and clouded with reddish. A subtriangular, occipital, deep-brown patch. A postocular vitta of the same color. Hind limbs barred with reddish-brown. Beneath unicolor.

SYN.—*Cystignathus nebulosus*, GRD. in Proc. Acad. Nat. Sci. Philad. VI, 1853, 422.

DESCR.—The head forms the third of the length, the limbs excluded. It is much depressed, as long as broad, subelliptical when viewed from above. Its upper surface is subconcave, and the canthus rostralis not very prominent. The nostrils are small, elongated, obliquely situated towards the origin of the anterior declivity of the snout; they are equidistant between the extremity of the upper jaw and the anterior rim of the orbits; the snout itself being quite prominent. The phrenic region is but slightly concave. The eyes are prominent, elliptical, with their longitudinal diameter equal to the three-fourths of the rostral distance, which extends from their anterior margin to the extremity of the upper jaw. The surface of the eyelid is granular like the head and body, and its external margin thickish and smooth. The interocular space is equal to the greatest width of the eyelid. The tympanum is not seen exteriorly. The mouth is broad; the upper jaw being slightly emarginated, whilst the lower one is provided with a small knob upon its symphysis. The tongue is large, thick, smooth, subcircular, slightly notched posteriorly, and free upon a very small extent. The inner nostrils are subcircular and proportionally large. The elongated groups of vomerine teeth are obliquely situated between the inner nostrils, at a little distance from the anterior edge of the latter openings. The Eustachian tubes are small and quite inconspicuous.

The body is elongated, raniform, depressed, narrowest posteriorly. The legs are slender and elongated; the anterior pair extending beyond the vent when bent backwards. The fingers are depressed, free, tapering, and rounded upon their extremities; the first one is longer than the second. The under aspect of their articulations is provided with small and conical tubercles. The palm of the hand is minutely granular. There are two large metacarpal tubercles, the outermost being considerably the largest. The hind legs are longer than the body and head together, of the whole length of the fourth finger. The heels meet together at the coccygeal region. The tarsus exhibits

a slight ridge along its inner margin. The toes are depressed like the fingers, margined with a membranous fold, tapering, rounded upon their extremities, and provided with small and conical, subarticulary tubercles. The sole of the feet exhibits a few granules towards the base of the toes. The metatarsal tubercles are comparatively small; the innermost being the largest.

The skin is minutely granular above, on the head as well as on the back; beneath, it is nearly smooth, some obsolete granules being occasionally seen.

The ground color above is light-brown, clouded with reddish-brown, and dotted with white along the dorsal region. There is a postocular, chestnut-brown band, extending beyond the shoulders. On the occiput may be seen a large, subtriangular, deep-brown patch stretching over the posterior two-thirds of the eyelid. The legs are transversely barred with reddish-brown. The inferior surface is unicolor, whitish under the head and throat, greyish on the abdomen, and reddish on the legs. The fingers and toes are yellowish.

Specimens of this species were collected in the neighborhoods of Valparaiso, Chile.

Plate III, fig. 19, represents *Cystignathus nebulosus*, size of life.
Fig. 20, is a side view of the head.
Fig. 21, the head, seen from above.
Fig. 22, under surface of the right hand.
Fig. 23, under surface of the right foot.

2. Cystignathus parvulus, Grd.

(Plate III, figs. 34–38.)

Car. spec.—*Dentibus vomerinis in seriem transversam, in medio vix interruptam, oblique post interiores nares, dispositis. Tympano conspicuo. Cruribus gracilibus. Supra fulvo-fusco, cum angusta vitta dorsali castaneae coloris ex naso usque ad medium corporis porrecta. Infra unicolori.*

Spec. Char.—Vomerine teeth disposed upon a transverse series, scarcely interrupted in the middle, and obliquely situated behind the inner nostrils. Tympanum distinct. Limbs slender. Yellow-

ish-brown above, with a dorsal, deep-chestnut, narrow band, extending from the snout to the middle of the body. Beneath unicolor.

SYN.—*Cystignathus parvulus*, GRD. in Proc. Acad. Nat. Sci. Philad. VI, 1853, 422.

DESCR.—The species we are now going to describe, is one of the smallest of the ranine group, assuming that the specimen before us is a full-grown one, and which seems plausible from its general aspect.

Its entire length is scarce seven-eighths of an inch, the head forming about the third of that length. Seen from above, the head is subtriangular or rather semi-elliptical, being almost uniformly rounded from the angle of the mouth to the extremity of the snout. It is one-fourth broader than long. Its upper surface is gradually sloping towards the margin of the upper jaw, giving it a wedge-shaped appearance. It is furthermore provided with a shallow groove, quite narrow between the eyes, widening upon the snout, where it is limited on either side by the canthus rostralis, itself, however, not very prominent. The nostrils are rather large, circular, and nearer the tip of the snout than the anterior rim of the orbits. The eyes are of medium size, subelliptical, with their longitudinal diameter equal to the rostral distance. The interocular space is much greater than the ocular diameter. The tympanum is of medium size, subcircular; its diameter being smaller than that of the eye. It is situated above, and a little posterior to the angle of the mouth. The mouth itself is not deeply—though broadly—cleft. The tongue is rather small and subcircular; attached by its whole under surface. The inner nostrils are proportionally large, subelliptical, and situated towards the edges of the roof of the palate. The vomerine teeth constitute two very narrow, approximated series, situated obliquely behind the inner nostrils; the outer extremity of each series being slightly curved and close to the inner edge of the orbit. The openings of the Eustachian tubes are but half the size of the inner nostrils, though very conspicuous.

The body is raniform, broader than deep, and narrowest posteriorly. The legs are slender, but proportionally well developed; the anterior ones will reach the groins when stretched backwards alongside the body. The fingers are depressed, slender, and tapering, provided under their articulations with small tubercles. The palm of the hand is smooth; there are two metacarpal tubercles, one at the base of the first finger, the other opposite the third. The first finger is longer than the second, which is equal to the fourth. The hind legs are a

little longer than the body and head together. The toes are slender and depressed, bordered by a membranous fold; their articulations being provided underneath with small tubercles. The sole of the feet is smooth. There are two small metatarsal tubercles.

The skin is smooth, without asperities, tubercles, or glands of any kind.

The color is light-yellowish or reddish-brown above. A chestnut-brown vitta extends from the snout over the nostrils, to the anterior rim of the eye. Behind the eye, the vitta is superiorly margined with white, and runs obliquely towards the occiput, hence, diverging towards the sides, terminates about the middle of the trunk. The legs are barred with blackish-brown. Beneath, the color is uniform reddish-brown; the posterior part of the thighs and legs assuming a more intense hue. On each side may be seen, proceeding from the belly, a blackish-brown, elongated, and tapering patch, inclined anteriorly towards the chest.

Found at Rio de Janeiro, Brazil.

Plate III, fig. 34, represents *Cystignathus parvulus*, size of life.
Fig. 35, is a side view of the head.
Fig. 36, an upper view of the head.
Fig. 37, under surface of right hand.
Fig. 38, under surface of left foot.

Genus PLEURODEMA, Tsch.

Gen. Char.—Vomerine teeth disposed upon two oblong groups, situated between the inner nostrils. Tongue subcircular, slightly emarginated, or entire posteriorly. Tympanum indistinct. Toes either entirely free or else provided with a rudimentary membrane at their base or along their edges. Skin pustulous or granular; sometimes a large lumbar gland on each side.

Syn.—*Pleurodema*, Tsch. Mém. Soc. Sc. nat. Neuch. II, 1838, 84.—Bell, Zool. Voy. Beagle. V, 1843, 36.—Grd. in Proc. Acad. Nat. Sci. Philad. VI, 1853, 420.

Observ.—Contrary to the opinion of Duméril & Bibron, and in accordance with that of Bell, we adopt the genus *Pleurodema* of Tschudi, to include such species of the genus *Cystignathus*, as under-

stood by the French herpetologists, which are provided with large and conspicuous lumbar glands. It is upon that character, exclusively to any other, that Thomas Bell reinstated the genus *Pleurodema* in the "Zoology of the Voyage of the Beagle."

Although it should be found that *Pleurodema* has a greater affinity with *Cystignathus* than with *Bombinator*—a fact which would bear upon its systematic position—yet there is no sufficient ground to combine its species with *Cystignathus* in one and the same group.

The species of this genus known to the present day are: PLEURODEMA BUFONIUM, Bell; P. DARWINII, Bell; P. NODOSA Grd. (*Cystignathus nodosus*, DUM & BIBR.), and those described further on.

1. PLEURODEMA BIBRONI, Tsch.

(Plate IV, figs, 33–38.)

SPEC. CHAR.—An ovoid lumbar gland on each side. Tympanum not apparent. Toes margined with a membranous fold. Two metatarsal tubercles. A cutaneous tarsal ridge. Skin generally smooth, occasionally pustulous.

SYN.—*Pleurodema bibroni*, TSCH. in Mém. Soc. Sc. nat. Neuch. II, 1838, 85.—GRD. Proc. Acad. Nat. Sci. Philad. VI, 1853, 420.

Bombinator ocellatus, Mus. Leyde.

Cystignathus bibroni, DUM. & BIBR. Erp. gén. VIII, 1841, 410.

Bufo arunco, LESS. Zool. Voy. Coq. II, i, 1830, 64. Pl. VII, fig. 5.

Pleurodema arunco, GRD. in Proc. Acad. Nat. Sci. Philad. VI, 1853, 420.

OBSERV.—In the Zoology of the "Voyage de la Coquille," Plate VII, fig. 5, Lesson gives a figure of the species here referred to, under the name of *Bufo arunco*, Schn.

But Schneider himself is not the author of that specific name, since the latter quotes Molina, "Hist. de Chile," I, 1788, 393, who, however, placed it in the genus *Rana*. Molina's diagnosis could never be intended for *Pleurodema bibroni*, for it reads: *Rana arunco, corpore verrucoso, pedibus palmatis.*

Lesson's descriptions of *Bufo arunco* and *B. thaul*, are transposed with regard to headings: evidently a printer's mistake.

DESCR.—The head is somewhat broader than long; its upper surface declivous, and the outline of the snout rounded. The nostrils

are a little nearer the orbits than the margin of the upper jaw. The eyes are subelliptical, of medium size. The eyelid is perfectly smooth above, like the upper surface of the head. The tongue is subelliptical, slightly notched posteriorly as well as anteriorly. The vomerine teeth are disposed upon two oblong groups, situated between the inner nostrils, quite apart from each other, almost transversal, the anterior extremity of each group reaching the inner margin of the latter openings, which, themselves, are quite conspicuous, well proportioned to the average size of the animal, and subcircular in shape. The openings of the Eustachian tubes are quite small. The tympanum is very small, its diameter being less than half that of the eye.

The body is elongated, subcylindrical, broader anteriorly than the head, tapering posteriorly, though in general appearance raniform.

The limbs are rather slender; the anterior ones, when bent backwards alongside to the body, are made to reach the groin with the extremity of the fingers; the latter are subcylindrical, slightly swollen upon their extremities, and provided under their articulations with small rounded tubercles; the second and fourth are equal in length, and shorter than the first. The palm of the hand is tuberculous; the first finger possesses a large, basal, and oblong tubercle; another, still larger tubercle, may be seen at the base of the carpus. The hind legs are longer than the body and head together, for the whole length of the toes and metatarsus. The toes are subdepressed, bordered with a membranous fold, and slightly webbed at their base. Their articulations are provided underneath with small tubercles; a few granules may occasionally be seen on the sole of the feet. The metatarsal tubercle, at the base of the first toe, is large and conspicuous, whilst the other is quite small. The tarsus is provided inwardly with a cutaneous fold, and the leg, from the knee to the tarsus, has a conspicuous, floating membrane, outwardly.

The skin is generally smooth all over the head, body, and legs. Occasionally small pustules are observed on the dorsal region and on the sides of the abdomen.

The lumbar glands are large and ovoid.

The ground color is reddish or greyish-brown, maculated with deep chestnut-brown. The maculæ on the upper parts of the body are either distinct or confluent, always very irregular in shape or outlines. The dorsal blotches may be margined with a light whitish line;

on the hind legs the blotches assume a transverse arrangement. Dots of the same color as the blotches are spread all over the surface, intermingled with whitish dots. Black spots are always to be observed on the lumbar glands, but not constantly upon their middle; they occupy sometimes the posterior half, varying in height. Several spots may likewise be noticed on the same gland. In one individual, where the blackish spot occupies the central portion of the gland, being surrounded then by a whitish areola, a whitish dot existed in the centre of the spot. A brown vitta extends from the eye, over the line of the canthus rostralis, to the very margin of the jaw, covering the nostril; the vitta from either side not coming into contact. In advance and under the eye is a patch, variable in shape, generally, however, subquadrangular, and occasionally extending from the margin of the jaw to the rim of the orbit. From the postero-inferior part of the orbit to the shoulder, extends an elongated and tapering patch of deep-brown, sometimes margined with white. Immediately above the tympanum and behind the eye, is another irregular patch. The occipital region is covered by the largest patch; in advance of which, and between the rostral vittæ, may be seen an elongated spot of the same color. Beneath, the color is whitish, the legs being sometimes reddish and occasionally clouded.

Numerous specimens were collected at Valparaiso, Coast of Chile. "Keeps about wet grounds, and manners entirely those of the true *Rana*." [Pickering.]

Plate IV, fig. 33, represents *Pleurodema bibroni*, size of life.
Fig. 34, is a side view of the head.
Fig. 35, the head, seen from above.
Fig. 36, the head, seen from beneath.
Fig. 37, under surface of right hand.
Fig. 38, under surface of left foot.

2. Pleurodema elegans, Bell.

(Plate IV, figs. 28–32.)

Spec. Char.—An ovoid lumbar gland on each side. Tympanum apparent, very small. Toes with a basal rudimentary membrane.

Skin smooth. A light longitudinal vitta or line from the snout to posterior extremity of the body.

SYN.—*Pleurodema elegans*, BELL, Zool. Voy. Beagle. V, 1843, 39. Pl. XVII, fig. 4.—GRD. in Proc. Acad. Nat. Sci. Philad. VI, 1853, 420.
Cystignathus elegans, GUICH. in *Gay*, Hist. de Chile. Zool. II, 1848, 101.

DESCR.—Although this species may easily be distinguished from the preceding one by the light line extending all along the dorsal region, still it is very closely related to it by all the characters of its structure. The general form is more slender, subfusiform, and the head more conical, being as long as broad. The snout is regularly rounded in a view from above. The nostrils are small and circular, and equidistant between the anterior rim of the eye and the margin of the upper jaw. The eyes, themselves, are subcircular, not prominent, with their diameter equal to the distance between them and the nostrils. The upper lid is smooth. The interocular space is equal to the diameter of the eye. The tympanum is more apparent than in the preceding species, but is very small. The tongue is subcircular, thick, slightly emarginated anteriorly, posteriorly entire, and free for about the fourth of its length. The vomerine teeth are disposed upon two oval groups as in the preceding species, and situated between the inner nostrils, though somewhat more obliquely. The inner nostrils, themselves, are circular and well developed. The openings of the Eustachian tubes are exceedingly small.

The anterior legs have proportionally the same length compared to the body as in the preceding species, that is to say, when bent backwards the tips of the fingers are made to reach the groins. The fingers are subdepressed, and their articulations provided beneath with small tubercles. The palm of the hand is finely granular, and at its base may be seen two quite large metacarpal tubercles. The tips of the fingers are round and smooth. The hind legs are almost equal in length to the body and head together. The toes are subdepressed like the fingers; slightly united at their base by a membrane, which, however, does not extend along their edge. Tubercles exist under their articulations. The sole of the feet is smooth. The metatarsal tubercles are quite prominent, and conical, though small. The membranous ridge, at the inside of the tarsus, is not very conspicuous.

The skin is smooth throughout.

The ground color above is brown, clouded with darker patches.

A yellowish-white vitta or stripe extends over the back, from the tip of the snout to the posterior extremity of the body. An elongated, dark patch extends from the eye to the shoulder, and two elliptical ones exist upon the extremity of the snout, in advance and beneath the eye; on the margin of the jaw may be observed a subquadrangular spot.

Collected near Valparaiso, Chile.

Plate IV, fig. 28, represents *Pleurodema elegans*, size of life.
Fig. 29, the head, viewed in profile.
Fig. 30, upper view of the head.
Fig. 31, under surface of left hand.
Fig. 32, under surface of right foot.

Genus WAGLERIA, Girard.

Car. gen.—*Dentibus vomerinis in continuam transversam seriem post interiores nares dispositis. Tympano parvo, inconspicuo. Linguat postice parumper incisa. Plantarum digitis plicaturâ membraneâ marginatis.*

Gen. Char.—Vomerine teeth disposed upon a continuous transverse series, situated behind the inner nostrils. Tympanum small and inconspicuous. Tongue slightly notched posteriorly. Toes bordered by a membranous fold.

Syn.—*Wagleria*, Grd. in Proc. Acad. Nat. Sci. Philad. VI, 1853, 42.

Observ.—Should *Cystignathus dorsalis*, Gray, prove specifically distinct from *Wagleria peroni*, this genus will then be composed of two species, both natives of Australia. Having no specimens of the latter at our command, our acquaintance with it is through the description of John Edward Gray.

Wagleria peroni, Grd.

(Plate III, figs. 29–33.)

Spec. Char.—Band of vomerine teeth long and slender. Tongue

subcircular, free upon its posterior third. Toes elongated and slender. Skin perfectly smooth. Ground color fuliginous, maculated above; unicolor beneath.

SYN.—*Cystignathus peronii*, DUM. & BIBR. Erp. gén. VIII, 1841, 409.
Wagleria peronii, GRD. in Proc. Acad. Nat. Sci. Philad. VI, 1853, 421.

DESCR.—The unique specimen of this species which we have before us is about an inch long. That it is *Cystignathus peroni* of Duméril & Bibron, we can only infer from their description, which, as far as it goes, applies perfectly to it. It must, however, be remembered that the said description is extremely brief, and hardly sufficient to establish thoroughly its identity.

The head forms about the third of the entire length, the limbs always excepted. It is a little broader than long, and when viewed from above, subovoid in its outline. Its upper surface is even and smooth, the snout being rather prominent and rounded. The nostrils are small, and nearer the eye than the margin of the upper jaw. The eyes are subelliptical, proportionally large; their longitudinal diameter being greater than the interocular space, and comprised twice in the rostral distance between their anterior rim and the nostrils. The upper lid is smooth above, and its margin sharp, and projecting considerably over the eyeball. The tympanum is indistinct, circular, rather small; its diameter being half that of the eye. It is situated immediately above and posteriorly to the angle of the mouth. The tongue is subcircular, very slightly emarginated posteriorly, and free for about one-third of its length. The inner nostrils are small but conspicuous and circular; the openings of the Eustachian tubes are smaller, though similar in form. The series of vomerine teeth is narrow and long; placed at some distance behind the inner nostrils, and extending almost across the whole width of the roof of the palate.

The body is elongated, subcylindrical. The anterior legs, when brought backwards alongside with the body, are made to reach the groins with the extremities of the fingers; the latter are subcylindrical, slender, and tapering, and provided beneath with small tubercles. The palm of the hand is smooth. There are two oblong metacarpal tubercles, the one at the base of the first finger being the largest. The first, second, and fourth fingers are almost equal in length. The hind legs are longer than the body and head together, for the whole length of the foot. The toes being slender and subcylindrical, margined in

the male by a membranous fold. The articulations, beneath, are provided with tubercles. The sole of the feet is smooth. There are two metatarsal tubercles; the outer one very small and inconspicuous.

The skin is perfectly smooth all over. The ground color is fuliginous with rather large brownish maculæ, one of which spreading over the occipital region and portion of the head and eyelid. The others are arranged upon irregular series along the back. The legs are barred. A brown streak runs from the margin of the upper jaw, along the line of the canthus rostralis to the eye. The sides of the abdomen and inferior region being unicolor, of a somewhat duller hue.

Collected in Southeastern Australia.

Plate III, fig. 29, represents *Wagleria peroni*, size of life.
Fig. 30, side view of the head.
Fig. 31, upper view of the head.
Fig. 32, under surface of right hand.
Fig. 33, under surface of left foot.

Genus RANIDELLA, Girard.

Car. gen.—*Dentibus vomerinis nullis. Lingua elongata, subelliptica, postice integra vel leviter emarginata, per tertiam longitudinis partem libera. Tympano inconspicuo. Tubulis Eustachianis parvulissimis. Plantarum digitis subcylindricalibus, minuentibus, liberis.*

Gen. Char.—Vomerine teeth none. Tongue elongated, subelliptical, posteriorly entire or else slightly emarginated, free upon one-third of its length. Tympanum not visible. Eustachian tubes minute. Toes subcylindrical, tapering, perfectly free.

Syn.—*Ranidella*, Grd. in Proc. Acad. Nat. Sci. Philad. VI, 1853, 421.

Observ.—This genus is allied to *Oxyglossus* and *Leiuperus* by the absence of teeth on the palate; differing, however, from both of them in having its tympanum entirely hidden, and its toes perfectly free.

Ranidella signifera, Grd.

(Plate III, figs. 39–43.)

Car. spec.—*Cute supra subtuberculosa, infra glandulosa. Macula hasti-*

forma in capite. Vitta dorsuali lata, fusca, antice bifurcata ad extremitatem maculae cephalicae accipiendum. Vitta laterali exigua, grisea, infra quam est vitta exiguior fusco nigrescens; abdominis lateribus et ventre marmoratis.

SPEC. CHAR.—Skin above, subtuberculous; beneath, glandulous. A spear-shaped blotch on the head. A broad, dorsal, deep-brown band, anteriorly bifurcated, to admit the extremity of the cephalic blotch. A lateral, greyish, narrow band, beneath which, another still narrower blackish-brown band. Sides of abdomen and belly marmorated.

SYN.—*Ranidella signifera*, GRD. in Proc. Acad. Nat. Sci. Philad. VI, 1853, 422.

DESCR.—This diminutive species, the only one hitherto known of its genus, has a comparatively small and conical head; when seen from above, it is depressed as usual, forming about the third of the length, the limbs excluded. The snout is rounded. The nostrils are quite small and subelliptical, almost equidistant between the anterior rim of the eyes and the margin of the upper jaw, rather nearer the former than the latter. The eyes, themselves, are elliptical, prominent; their longitudinal diameter being equal to the distance between their anterior rim and the tip of the snout. The interocular space is somewhat wider than the upper lid. The tympanum is entirely hid under the skin. The mouth is deeply cleft; the tongue is elongated, subcylindrical, narrowest anteriorly, free posteriorly, for about the third of its length, and showing but a very obsolete indentation. The inner nostrils are subcircular, quite conspicuous, situated towards the edges of the roof of the palate. The openings of the Eustachian tubes are minute, scarcely perceptible. The maxillary teeth are exceedingly small. The symphysis of the upper jaw is entire; that of the lower jaw is provided with a very small knob.

The body is elongated, raniform, subcylindrical, somewhat depressed. The anterior legs, when inclined backwards, reach the groins with the tip of the fingers. These, as well as the toes, are free, subcylindrical, tapering into a point, and provided under their articulations with small tubercles. The first finger is shorter than the second, which is longer than the fourth; the third is conspicuously the longest. The palm of the hand is rugose; there are two metacarpal tubercles

or horny disks, the outermost being the largest, whilst the innermost, which is situated at the base of the first finger, is inconspicuous. The hind legs are slender, longer than the body and head together, by the whole length of the fourth toe. The inner edge of the tarsus exhibits a horny ridge. The sole of the feet is smooth. The outer metatarsal tubercle is smaller than the inner one.

The skin above, is provided with elongated, warty tubercles, extending over the head and dorsal region. The inferior regions are covered with crowded, large, pavement-like glands, especially conspicuous on the abdomen.

The ground color above, is sometimes uniform greyish-brown, with transverse blackish maculæ upon the legs. A blackish vitta extends from the tip of the snout along the line of the canthus rostralis, through the eye towards the shoulder, and tapering into a point. A blackish triangular patch may be observed on the margin of the upper jaw, in advance and beneath the eye, or else several spots all along the branch of the maxillary. A yellowish-green band may be observed from under the eye to the angle of the jaw. The lower surface of the head is blackish-brown. The belly is yellowish-brown, scattered all over with small black spots; the legs reddish brown, likewise maculated; the fingers and toes being reddish.

In other individuals a spear-shaped spot exists upon the middle region of the head, behind which, and all along the back, may be seen a brownish-black band, anteriorly bifurcated, so as to admit the posterior extremity of the cephalic spot. On each side of the dorsal band is another, narrower band, of a yellowish-grey, stretching over the head, and along the sides of the body; from behind the orbits to the groins, extends a still narrower, brownish-black, band.

This species is a native of Australia: several specimens having been collected on the southeastern coast of that continent.

Plate III, fig. 39, represents *Ranidella signifera*, size of life.
Fig. 40, is a profile of the head.
Fig. 41, an upper view of the head.
Fig. 42, under surface of the left hand.
Fig. 43, under surface of the right foot.

Fam. HYLIDAE.

Teeth in the upper jaw, and generally on the vomer also. Tongue oftentimes bifurcated posteriorly. No parotid glands. Extremities of fingers and toes dilated into a disk-like expansion. Abdomen generally glandulous.

Syn.—*Hylae*, Tsch. Mém. Soc. Sci. nat. Neuch. II, 1838, 70.
Hylaeformes, Dum. & Bibr. Erp. gén. VIII, 1841, 491.

Observ.—Time may come when herpetologists will no longer admit of any primary distinction between the frogs (*Ranidae*) and the tree frogs (*Hylidae*). The dilatation of the extremities of the fingers in tree frogs seems to loose some of its value in *Ranoidea* and *Halophila*, and accordingly bears somewhat upon their habits.

Genus RANOIDEA, Tsch.

Gen. Char.—Vomerine teeth disposed upon two groups, situated between the inner nostrils. Tongue large, subcircular or elliptical, slightly notched posteriorly, and free about one-third or less of its length. Tympanum distinct. Eustachian tubes large. Fingers and toes depressed, terminated by small subelliptical disks; former, perfectly free; latter, webbed. A vocal, subgular, bladder in the male. Abdomen glandulous.

Syn.—*Ranoidea*, Tsch. Mém. Soc. Sci. nat. Neuch. II, 1838, 76.—Grd. in Proc. Acad. Nat. Sci. Philad. VI, 1853, 422.

Observ.—The aspect of the genus *Ranoidea* is ranine, owing to the elongation of the head and body. The structure of the feet and the disposition of the vomerine teeth remind us of the genus *Rana*, whilst the tongue and the dilatation of the digits give to it a certain affinity with *Hyla*. The dilatations of the fingers and toes, however, are much less developed than in *Hyla;* and the fingers are never palmated. If habits go for anything in the distinction of genera, the fact that Ranoidians are more frequently seen about waters than on trees, would certainly have a weight in the question.

The United States Exploring Expedition has brought home two

very characteristic species, both of which being apparently distinct from the one upon which Tschudi has framed his genus, labelled in the Museum of Paris, *Hyla jacksoniensis*. The latter name having received no publicity until 1838, and the same species having been described by Lesson in 1830, its nomenclature will read as follows:

RANOIDEA AUREA, GRD.—*Rana aurea*, LESS. Voy. Coq. Zool. II, i, 1830, 60. Pl. VII, fig. 2. (See page 62 of the present volume.)
Ranoidea jacksoniensis, TSCH. Mém. Soc. Sci. nat. Neuch. II, 1838, 79.
Hyla jacksoniensis, Mus. Par. MS.—DUM. & BIBR. Erp. gén. VIII, 1841, 602.

It is more closely allied to *R. resplendens* than to *R. flavo-viridis*. We regret not being prepared to establish its identity or difference upon the specimens of the Paris Museum.

1. RANOIDEA RESPLENDENS, Grd.

(Plate III, figs. 7–12.)

CAR. SPEC.—*Capite depresso, producto. Tympano magno, elliptico. Lingua modica. Plantarum digitis ad discos terminales usque palmatis; membrana emarginata. Supra viridi, maculis et lineis aureis notata.*

SPEC. CHAR.—Head depressed, elongated. Tympanum large, elliptical. Tongue moderate. Toes webbed, up to the digital disks; membrane emarginated. Deep-green above, maculated and streaked with gold.

SYN.—*Ranoidea resplendens*, GRD. in Proc. Acad. Nat. Sci. Philad. VI, 1853, 422.

DESCR.—The general physiognomy of this species is most raniform; the head and body being quite elongated. The head is longer than broad, depressed, subconcave on the occipital region, and flat anteriorly. The snout is prominently rounded, and equally declivous towards the tip of the snout and sideways, where it is subconcave. The canthus rostralis is but slightly apparent, and beneath which are situated the rather small and subconical nostrils, equidistant between the anterior rim of the eye and the extremity of the upper jaw. The eyes are of medium size, subcircular; their diameter being equal to the rostral distance between their anterior rim and the nostrils. The

interocular space is somewhat smaller than their diameter. The tympanum is rather large, elliptical, and obliquely situated above the angle of the mouth. Its greatest diameter is equal to that of the eye. The mouth is large; the tongue elliptical, notched posteriorly, and free for about one-fifth of its length. The inner nostrils are large, semi-circular, concave upon their posterior margin; their anterior margin being nearly rectilinear. The openings of the Eustachian tubes are larger than the inner nostrils, and similarly shaped, but their convexity is on the opposite side. The vomerine teeth constitute two elongated groups, disposed upon a transverse line between the inner nostrils; very little interrupted upon the middle, and close to the inner edge of the latter openings.

The body is broader than deep; the neck is slightly contracted. The limbs are well developed; the anterior ones, when bent backwards alongside with the body, project the tip of their fingers beyond the groins. The fingers, themselves, are depressed and perfectly free; the first one is nearly equal to the second; the fourth is longer than the first and second; the third is the longest; they are provided with large tubercles under their articulations. The terminal disks are subelliptical. The palm of the hand is granular. There are no metacarpal tubercles; the base of the first finger is considerably swollen, and upon its outer margin may be seen a horny growth representing probably the tubercle which is usually found there in batrachians. In bringing the posterior legs forwards, the tarsus and foot project beyond the extremity of the snout. A membranous fold is observed along the inner edge of the tarsus. A single, considerably developed, metatarsal tubercle exists at the base of the outer toe. The sole of the feet is smooth. The toes are depressed like the fingers, and provided beneath their articulations with conspicuous tubercles. The digital dilatations are smaller than anteriorly, but are elliptical in their shape. The membrane which unites the toes, extends to the extremity of the last phalanx (to the last but one in the fourth), but is emarginated, though not so much so as in the following species.

The skin is smooth throughout, if we except the sides of the abdomen, the belly, and the inferior surface of the thighs, which are glandulous.

The ground color above, is of a beautiful deep-green. On each side of the back there is a sinuous golden streak. A similar band of gold extends from behind the eyes to the posterior region of the body.

A yellowish vitta runs from the snout to the angle of the mouth, in passing under the eyes and nostrils. A black vitta is observed on the line of the canthus rostralis, and is seen beyond the eye, running to a considerable distance on the flanks, sending off a black patch behind the tympanum. The iris and upper lid are golden. The forelegs are green on the sides, margined with black, and golden above; the hind legs are golden on the sides, and green above. The fingers, toes, and membrane are golden-yellow. Underneath, the color is of a uniform yellowish tint.

Caught in January, 1840, at Woolongong, Illawara, New South Wales, in water near the coast, and sketched from life by Mr. Drayton.

Plate III, fig. 7, represents *Ranoidea resplendens*, size of life.
Fig. 8, a side view of the head.
Fig. 9, an upper view of the head.
Fig. 10, the head, seen from beneath.
Fig. 11, under surface of the left hand.
Fig. 12, under surface of the left foot.

2. Ranoidea flavo-viridis, Grd.

Car. spec.—*Capite depresso, discoidali. Tympano modico, orbiculato. Lingua magna. Plantarum digitis ad postremae phalangis medium usque palmatis; membrana valde emarginata. Supra viridi; cantho rostrali linea nigra notato; quae linea post oculum continuatur. Femoris superficie posteriori purpurescente, punctis albis notata.*

Spec. Char.—Head depressed, discoid. Tympanum moderate, circular. Tongue large. Toes webbed to the middle of the last phalanx; membrane deeply emarginated. Above, green with a black line along the canthus rostralis, and a black band behind the eye. Posterior surface of thighs purplish, white dotted.

Syn.—*Ranoidea flavo-viridis*, Grd. in Proc. Acad. Nat. Sci. Philad. VI, 1853, 422.

Descr.—The head is broader than long, very much depressed, flattened upon the occiput, and between the eyes. Viewed from above,

it is almost subelliptical, its sides being rounded, and the snout not very prominent, itself rounded above and declivous upon the sides. The nostrils are oblong, situated immediately below the canthus rostralis, and nearer the extremity of the upper jaw than the anterior rim of the orbit. The eyes are large, prominent, their longitudinal diameter being greater than the rhinic distance between their anterior rim and the nostrils. The upper lid is smooth, like the skin of the head and back. The interocular space is a little less than their diameter. The tympanum is conspicuous, circular, its diameter being half that of the eye. The mouth is large, and so is the tongue, which is regularly elliptical, and but slightly emarginated, slightly free posteriorly and laterally. The inner nostrils are very large, subtriangular; the openings of the Eustachian tubes are much smaller. The vomerine teeth constitute two oblong groups, situated exactly between the inner nostrils; subtransversal, separated from each other by a narrow space, and approximating closely to the inner edge of the nostrils.

The body is flattened like the head, broad anteriorly, and tapering posteriorly. The limbs are slender and long, compared to the body. The anterior ones, however, when brought alongside to the body, only reach the groins with the extremities of the fingers. The latter are entirely free, depressed, provided with tubercles under their articulations. The disks under their extremities are oblong and of medium size. The palm of the hand is subgranular, and provided at its base with two flattened disks almost blended with the skin. The hind legs are longer than the body and head together, by two-thirds of the tarsus and the remaining portion of the foot. The tarsus exhibits a small membranous ridge along its inner edge. The sole of the feet is very minutely pustulous. The toes are webbed up to the middle of the last phalanx (on the fourth toe to the end of the last but one); but the membrane is very deeply emarginated. The tubercles under their articulations are quite conspicuous. The terminal expansions are fashioned like those of the fingers, being rather small compared to the size of the animal. The skin is smooth throughout; small glands may be seen on the side of the chest, on the abdomen, and under the thighs.

The color above, is green, with yellowish tints about the eyes, the sides of the abdomen, and legs. A narrow black vitta extends along the line of the canthus rostralis. A black, much broader vitta, extends from behind the eyes to the sides beyond the shoulders. The

thighs posteriorly are bluish-purple, minutely dotted with white. Underneath, the color is uniform yellowish-green.

A young specimen exhibits a much deeper green hue upon the upper region, while the sides of the legs are of a deeper yellow, almost orange. In the same individual, the palatine teeth constitute but two very indistinct groups, apparently more distant from each other, than in the one just described; but this may be accounted for by the smaller size of the inner nostrils, which are elliptical instead of being triangular.

Specimens were found about fresh-water streams, near Woolongong, Illawara, New South Wales, at the residence of the Attorney-General, in January, 1840.

Genus HYLARANA, Tsch.

Gen. Char.—Vomerine teeth disposed upon two groups, situated between or behind the inner nostrils. Tongue elongated, narrow anteriorly, broad, and forked posteriorly. Tympanum distinct. Eustachian tubes moderate. Fingers free. Toes webbed. Subdigital disks moderate.

Syn.—*Hylarana*, Tsch. Mém. Soc. Sci. nat. Neuch. II, 1838, 78.—Grd. in Proc. Acad. Nat. Sci. Philad. VI, 1853, 423.
Limnodytes, Dum. & Bibr. Erp. gén. VIII, 1841, 510.
Ranhyla, Dum. & Bibr. Erp. gén. VIII, 1841, 511.

Orserv.—This genus combines the structure of both *Rana* and *Hyla*, having all the characters of true *Rana* with the exception that the extremities of the fingers and toes are dilated into a disk, which is much less developed, however, than in *Hyla*.

Hylarana mindanensis, Grd.

Car. spec.—*Dentes vomerini inter et post nares interiores in duos acervos elongatos collocantur. Cute pustulosa. Colore fusco-viridescente; maxilla superiori maculata.*

SPEC. CHAR.—Vomerine teeth disposed upon two elongated groups, situated between and behind the inner nostrils. Skin pustulous, greenish-brown; upper jaw spotted.

SYN.—*Hylarana mindanensis*, GRD. in Proc. Acad. Nat. Sci. Philad. VI, 1853, 423.

DESCR.—This appears to be the smallest species of its genus, the greatest length of the body and head together measuring but one inch, the head forming about the third of it, and is as long as broad. The upper surface of the head is almost flat, and, when viewed from above, ovoid in its outline. The snout is elevated, rounded, narrow, and quite prominent. The nostrils are conspicuous, and nearer the extremity of the snout than the anterior rim of the orbit. The space between the nostrils and eyes is subconcave, whilst the margin of the jaw constitutes a convex ridge. The eyes are proportionally large and prominent, subcircular in shape, their diameter being equal to the distance between their anterior rim and the extremity of the snout. The interocular space is equal to the greatest width of the upper lid, which, itself, is smooth like the surface of the head. The tympanum is situated very close to the eye, and is less in diameter than the latter. The tongue is large, fleshy, subelliptical; its posterior bifurcation being narrow and diverging. The inner nostrils are subcircular, of medium size, and situated near to the jaw-bone. The vomerine teeth are not very conspicuous; disposed upon two narrow, widely separated, elliptical groups or series, directed obliquely inwards and backwards from the posterior margin of the inner nostrils.

The body is elongated, subcylindrical; the anterior limbs slender, shorter than the trunk; the posterior ones, comparatively well developed, longer than the body and head together, by the whole length of the foot. The fingers are subdepressed; the first is but very little longer than the second and fourth; the latter two being nearly equal. The palm of the hand exhibits ridges running in the direction of the fingers. The articulations of the latter are provided beneath with conspicuous though small knobs or tubercles, in every point similar to the swellings on the inferior surface of their extremities. The toes are webbed, very nearly to their tips, but the membrane is very deeply concave between all of them. The swellings at their extremities are larger than the tubercles under their articulations. There is but one metatarsal tubercle, situated at the base of the inner toe, from which

a horny ridge extends along the inner edge of the tarsus. The exterior ridge of the fifth toe is bordered by a membranous ridge, which, however, does not reach quite to its extremity.

The skin above is minutely pustulous, and smooth beneath.

The ground color is greenish-brown, uniform and lighter beneath. There are obsolete darker spots on the body as well as on the limbs. The margin of the upper jaw and sides of the head exhibit similar traces of maculæ.

Loc.—Two specimens were collected in the Caldera, on Mindanao.

Genus HALOPHILA, Girard.

Char. gen.—*Dentes vomerini inter et post nares in acervos duos elongatos collocantur. Lingua elongata, lanceolata; antice angusta, postice bifurcata, per dimidiam ejus longitudinem libera. Tympano distincto. Tubulis Eustachianis modicis. Palmarum digitis liberis, plantarum vero aliquantulo palmatis. Discis subdigitalibus magnitudine diversis.*

Gen. Char.—Vomerine teeth disposed upon two oblong groups, situated between and behind the inner nostrils. Tongue elongated, lanceolated, narrow anteriorly, forked posteriorly, and free half its length. Tympanum distinct. Eustachian tubes moderate. Fingers free. Toes with rudimentary web at their base. Subdigital disks varying in development.

Syn.—*Halophila*, Grd. in Proc. Acad. Nat. Sci. Philad. VI, 1853, 423.

Obsery.—This genus is very intimately related to *Hylarana*, and like the latter, combines characters of both *Hyla* and *Rana*. It has the forked tongue of *Rana*, and the extremities of the fingers and toes dilated as in *Hyla*. It is distinguishable from *Hylarana* by its tongue, which is free behind on a greater extent; by its toes, which are but slightly webbed at their base, and by its digital extremities more developed, and, therefore, resembling more the same parts in *Hyla*. The shape of the body and head, on the other hand, resembles *Rana* most.

We consider, as belonging to this genus, *Rana papua*, Less. in Voy. Coq. Zool. II, 1830, 59. Pl. VII, fig. 1.

1. Halophila heros, Grd.

(Plate IV, figs. 1–6.)

Char. spec.—*Discis subdigitalibus parvulis. Colore subviridi fuscato, cum clariori vitta dorsuali. Abdominis lateribus cruribusque nigro maculatis. Infra fusca.*

Spec. Char.—Subdigital disks small in both pairs of limbs. Greenish-brown, with a dorsal light line. Sides of abdomen and limbs spotted with black. Beneath, dull-brown.

Syn.—*Halophila heros*, Grd. in Proc. Acad. Nat. Sci. Philad. VI, 1853, 428.

Observ.—A preliminary glance at the figure which represents this species would leave the impression of a *Cystignathus*, or better, perhaps, of a *Leptodactylus*. The remarkable size of the species, its much developed locomotory organs, and the slenderness of the digits, all contribute to the aspect just alluded to. The comparatively small development of the terminal subdigital disks has also a good deal to do with its general physiognomy.

Descr.—The head forms more than the third of the length. It is as long as broad, and, seen from above, it has a subtriangular shape, the snout being but slightly truncated. Its upper surface is flattened; the phrenic region depressed or subconcave; the canthus rostralis almost even with the upper surface of the snout. The nostrils are comparatively small, elongated, obliquely situated towards the upper region of the snout, and close to its anterior declivity. Their distance from the anterior rim of the orbits is twice that which extends between them and the margin of the upper jaw. The eyes are large, prominent, subcircular; their diameter being equal to the distance between them and the nostrils, and which is quite considerable. The interocular space is but two-thirds of the longitudinal diameter of the eye. The tympanum is rather large and conspicuous, subcircular; a vertical line drawn through its middle would intersect the angle of

the mouth. Its diameter corresponds nearly to the radius of the eye. The mouth, as may be expected from the size of the head, is very large. The tongue is very much developed, spear-shaped, narrowest anteriorly. Its posterior bifurcation is very conspicuous, the organ, itself, being free posteriorly, for more than half of its entire length. The maxillary teeth are very minute. The inner nostrils are large, transversely elongated, reaching almost the branches of the maxillary. The vomerine teeth constitute two stout, elongated, or subtriangular groups, obliquely situated between and behind the inner nostrils, leaving an appreciable space between the inner edge of the latter and their anterior extremity. The openings of the Eustachian tubes are quite large, though much smaller than the inner nostrils, and either subtriangular in shape or longitudinally oblong or elliptical.

The body is elongated, broader than deep, and tapering posteriorly, as in *Rana* and *Leptodactylus*. The limbs are very much developed and stoutish. The anterior ones, when brought backwards alongside the body, reach almost the coccyx with the extremity of the fingers. The palm of the hand is smooth, and provided with one, rather large, horny disk at the base of the inner finger. The fingers themselves are subdepressed, entirely free, and provided with large tubercles under their articulations. The first is longer than the second, which is shorter than the fourth. Their tips are but slightly expanded. The hind limbs are longer than the body by the whole length of the foot. The tarsus has no membranous fold or horny ridge along its inner edge. The soles of the feet are perfectly smooth; there is but one developed metatarsal tubercle, at the base of the inner toe. Tubercles may be observed under each articulation, and the dilatations of their extremities likewise, are but little developed. The rudiment of a membrane is observed at the base of all the toes.

The skin is smooth all over, except on the inferior and posterior surfaces of the thighs, which are minutely glandulous.

The ground color is greenish-brown, the green predominating upon the sides and the limbs. There is a slender dorsal line extending from the head to the posterior part of the body, and a similar one along the limbs. The sides of the abdomen, head and legs, are sprinkled over with small blackish spots, surrounded with bluish-white on the abdomen. The fingers and toes are green and yellow. Beneath, the coloration is of a uniform dull-brown.

The species inhabits the Feejee Islands.

Plate IV, fig. 1, represents *Halophila heros*, size of life.
Fig. 2, a side view of the head.
Fig. 3, an upper view of the head.
Fig. 4, the head, seen from beneath.
Fig. 5, under surface of the left hand.
Fig. 6, under surface of the left foot.

2. Halophila vitiensis, Grd.

(Plate IV, figs. 7–11.)

Car. spec.—*Discis subdigitalibus magnis. Colore luteo.*

Spec. Char.—Subdigital disks large in both pairs of limbs. Yellowish-orange.

Syn.—*Halophila vitiensis*, Grd. in Proc. Acad. Nat. Sci. Philad. VI, 1853, 423.

Descr.—The head is depressed, elongated, narrowing anteriorly. Its upper surface is smooth, flattened from the occipital region to the nostrils, hence, declivous towards the margin of the jaw; its sides are sloping, and the phrenic region is depressed. The nostrils, oblong in shape, are obliquely situated near the upper part of the snout, at the culminating point of its declivity, and twice as distant from the anterior rim of the eye than the margin of the upper jaw. The eyes are proportionally large, subelliptical in shape; their longitudinal diameter being equal to the rhinic distance from their anterior margin to the nostrils. The interocular space is equal to the ocular diameter. The tympanum is quite conspicuous, subcircular; its diameter being greater than the radius of the eye; it is situated immediately above and posteriorly to the angle of the mouth, at a little distance from the orbit. The mouth, itself, is deeply cleft; the tongue is elongated, subpyriform, narrowest anteriorly, and free upon its posterior half; laterally, it is but slightly so. The inner nostrils are quite large, transversly elliptical, situated towards the periphery of the palatine roof. The vomerine teeth are disposed upon two oblong groups, widely separated from each other and situated obliquely behind the

inner and posterior edge of the inner nostrils. The openings of the Eustachian tubes are conspicuous, large, though somewhat smaller than the inner nostrils.

The body is elongated, subcylindrical, raniform. The limbs are well developed, and the dilatations at the extremities of the fingers and toes, large and conspicuous: larger upon the former than upon the latter.

The anterior legs, when bent backwards alongside with the body, reach the groins, with the extremities of the fingers, and even project somewhat beyond, though not as far as the coccyx. The fingers are depressed; provided under their articulations with rounded tubercles. A few of these, but a great deal smaller, may be seen scattered over the palm of the hand. There are no metacarpal disks or horny knobs or tubercles. The hind legs are longer than the body and head together, of the whole length of the metatarsus and toes. The tarsus shows no traces of either a horny ridge or a membranous fold along its inner edge. The metatarsus exhibits two very small tubercles, one, as usual, at the base of the first toe, the other outwardly. The sole of the feet is smooth. The articulations of the toes are protected underneath with small tubercles. The toes themselves are depressed like the fingers, and united by a membrane at their base only.

The skin is perfectly smooth throughout, except posteriorly and beneath the inner half of the thighs, where it is glandulous; the posterior part of the belly has, likewise, a glandulous aspect.

The color is of a bright uniform yellowish-orange of a duller hue beneath than above. The iris is yellow.

Specimens of this species were collected in May, 1840, at Sebukea, Feejee Islands. A drawing from life was made by Mr. Jos. Drayton.

Plate IV, fig. 7, represents *Halophila vitiensis*, size of life.
Fig. 8, side view of the head.
Fig. 9, upper view of the head.
Fig. 10, under surface of the left hand.
Fig. 11, under surface of the right foot.

3. Halophila dorsualis, Grd.

(Plate IV, figs. 12–16.)

Car. spec.—*Discis subdigitalibus modicis. Colore purpureo-rubescente.*

SPEC. CHAR.—Subdigital disks moderate in both pairs of limbs. Reddish-purple, with a dorsal light line, and maculated with black.

DESCR.—Of this species there was but one specimen collected, now in a very precarious state of preservation. In its general aspect it resembles more *H. heros* than *H. vitiensis*, but is easily distinguished from the former by a much greater dilatation of the extremities of fingers and toes. The membrane at the base of the toes is also more developed than in *H. heros*.

The ground color is yellowish-purple, more intense along the sides. The upper surface of the head and body exhibits a golden hue, and along the middle region of the back is a whitish, narrow vitta, extending from the snout to the posterior extremity of the body. On each side of that dorsal line are blackish maculæ, largest upon the head and anterior part of the body, and smallest along the sides. The legs are barred with black. The iris is purplish.

Found, with the preceding species, on the Feejee Islands. A drawing from life having been made by Mr. Drayton, its form and general appearance were thus preserved.

Plate IV, fig. 12, represents *Halophila dorsualis*, size of life.
Fig. 13, is a side view of the head.
Fig. 14, an upper view of the head.
Fig. 15, under surface of the left hand.
Fig. 16, under surface of the left foot.

GENUS HYLA, LAUR.

GEN. CHAR.—Vomerine teeth disposed upon two groups, situated between the inner nostrils. Tongue large, circular, or elliptical, slightly notched, and free posteriorly. Tympanum distinct. Fingers and toes depressed, very much dilated upon their extremities. Toes webbed, and the fingers occasionally also.

SYN.—*Hyla*, LAUR. Synos. Rept. 1768.—LINN. Syst. Nat. ed. X, 1768, 213.—DUM. & BIBR. Erp. gén. VIII, 1841, 542.

OBSERV.—In some species the fingers as well as the toes are webbed

to a greater or lesser degree. In a systematic work it might be well to arrange in one group such as have the fingers entirely free, and in another group those in which they are webbed.

Hyla regilla, B. & G.

(Plate III, figs.13–18.)

Car. spec.—*Dentes vomerini in acervos duos orbiculatos collocantur. Palmarum digitis liberis, plantarum semipalmatis. Cute tuberculosa superne, inferne glandulosa. Colore viridi ad luteum vergente; maculis vel vittis fuscis corpore dispersis.*

Spec. Char.—Vomerine teeth disposed upon two circular groups. Fingers free. Toes semipalmated. Skin above, tuberculous; beneath, glandulous. Green, with orange reflections; maculated or banded with blackish-brown.

Syn.—*Hyla regilla*, B. & G. in Proc. Acad. Nat. Sci. Philad. VI, 1852, 174; et 1853, 301.

Hyla scapularis, Hallow. in Proc. Acad. Nat. Sci. Philad. VI, 1852, 183.

Observ.—Amongst the numerous specimens before us, the one represented in figure 13 is the largest; and, according to all probabilities, illustrates the fullest dimensions of this species.

Descr.—The head is subtriangular, nearly as long as broad; the snout is subtruncated, slightly declivous, with a quite prominent canthus rostralis. Its upper surface is nearly plane, or slightly subconcave. The space between the nostril and the eye is slightly concave also. The nostrils occupy the highest part of the snout, being much nearer its extremity than the anterior rim of the orbit. The eyes are prominent and large, circular, and elevated above the surface of the head. The tympanum is subelliptical; its diameter is half that of the eye. The tongue is broad, subelliptical, and but slightly notched posteriorly. The maxillary teeth are very minute, and invisible to the naked eye, especially on the lower jaw. The palatine teeth form two small and circular groups situated between the inner nostrils, and as far apart from the latter as the space between them. The

inner nostrils, on the other hand, are quite large, very conspicuous, and circular in shape. The Eustachian tubes being of medium size.

The body is twice and a half as long as the head; it is elongated, raniform. The anterior feet, when stretched alongside the body, scarcely reach the groins with their extremities. The fingers are perfectly free, slender, and their terminal disks of medium size. The inner finger is the smallest; the outermost, a little longer than the second; the third is the longest, being about one-fourth longer than the fourth. The inferior surface of the carpus is minutely granular. Small tubercles may be observed under each digital articulation. The hind legs are long and slender; the knees touch the elbows when brought close to the body. The leg proper is somewhat longer than the thigh; the tarsus and foot together are as long as the body, the head excluded. A membrane unites the toes to about half their length. A small, horny, spade-like tubercle exists at the base of the inner and smallest toe; the fourth toe is the longest, and the fifth about equal to the third. The terminal disks are a little smaller than those of the fingers, though similar in structure; there being a medial longitudinal furrow, dividing them into two halves or hemidisks. A minute granulation is also to be observed under the sole of the feet, and small tubercles under the articulations of the toes..

The skin above, is smooth; a few very small and scattered tubercles are observed on the two anterior thirds of the body and head, more crowded on the upper lid. The legs are either smooth or, likewise, provided above with small tubercles. On the inferior surface of the body, a pectoral fold extends from one shoulder to another, and in the male, there are well developed vocal pouches, perfectly smooth, whilst in the female the inferior surface of the head is minutely granular. The granulation is coarser on the anterior portion of the belly than posteriorly, and under the thighs, it is quite fine.

In the adult, the ground color is deep-green, with orange or golden reflections on the sides of the head, abdomen, and legs. A deep-brown vitta extends from the nostrils to the anterior rim of the orbit, passing over the eye, across the tympanum, down the abdomen to the groin; sometimes, however, an irregular series of spots is observed along the abdomen. Transverse series of dots are seen on the limbs, and longitudinal series along their outer edge, extending also to the toes. Sometimes, and perhaps only in the male, may be observed two dorsal longitudinal brown vittæ, one on each side of the back, extend-

ing from the occiput to near the termination of the body, and upon the head, from one eye to the other, a V-shaped patch, the summit of which is directed posteriorly. The inferior surface is of a uniform dull-yellow.

In the young, the ground color is light-green, with a few black spots on the sides of the abdomen, exhibiting also the facial vitta, though less distinctly. Inferiorly it is of a soiled white.

Specimens were collected on Puget's Sound; the colored drawings were made from life by Mr. Drayton.

Plate III, fig. 13, represents *Hyla regilla*, size of life.
Fig. 14, is a side view of the head.
Fig. 15, an under view of the same.
Fig. 16, under surface of the right hand.
Fig. 17, under surface of the right foot.
Fig. 18, represents the same species in an immature state of growth

2. Hyla cyanea, Schleg.

Syn.—*Hyla cyanea*, Schleg. Abbild. Amph. 1837–44, 26. Pl. ix, fig. 2.

Observ.—The only specimen of this species brought home from Australia, by the Exploring Expedition, is a dried skin, so much deformed in its prepared state, that we were unable to draw up any accurate description.

The synonyms of this species, as quoted by Messrs. Duméril and Bibron (Erp. gén. VIII, 1841, 577), are all referable, except Schlegel's, to *Ranoidea aurea* (*Hyla jacksoniensis*, Dum. & B.).

But Schlegel is not the originator of either the species or the specific name. He took the name from Fitzinger, who borrowed it from Daudin, and applied it to a distinct and well marked species; whilst Daudin's *Hyla cyanea* is nothing else but his *Rana coerulea*, which is identical with *Ranoidea aurea*.

Genus HYLODES, Fitz.

Gen. Char.—Vomerine teeth disposed upon two elongated series, situated behind the inner nostrils. Tongue elliptical, posteriorly

entire, and free upon the half of its length. Tympanum distinct. Fingers and toes free, subdepressed, provided, upon their extremities, with small disks. Abdomen smooth.

SYN.—*Hylodes*, FITZ. N. Class. Rept. 1826, 64.—DUM. & BIBR. Erp. gén. VIII, 1841, 619.

HYLODES PARVUS, Grd.

(Plate III, figs. 24–28.)

CAR. SPEC.—*Dentibus vomerinis in figuram V, ad verticem leviter interruptam, dispositis. Lingua crassa et cordiformi. Palmarum et plantarum digitis tenuibus. Colore ubique fusco.*

SPEC. CHAR.—Vomerine teeth disposed upon a V-shaped figure, slightly interrupted at the summit. Tongue thickish and cordiform. Fingers and toes slender. Uniform dark-brown.

SYN.—*Hylodes parvus*, GRD. in Proc. Acad. Nat. Sci. Philad. VI, 1853, 423.

DESCR.—The head is nearly as broad as long, and, when viewed from above, it has a subovoid appearance; it gradually diminishes anteriorly, the snout being rounded and declivous. Its upper surface is almost even, although a shallow depression may be observed from the occipital region to the nostrils. The latter are subelliptical, situated towards the upper surface of the snout, immediately beneath the canthus rostralis, and much nearer the margin of the upper jaw than the anterior rim of the eye. The phrenic region, posterior to the nostrils, is depressed. The eyes are proportionally well developed, prominent, subcircular; their diameter being a little larger than the distance between their anterior rim and the nostrils. The upper lid is smooth. The interocular space is about equal to the diameter of the eye. The tympanum is rather small, vertically ovoid, the narrowest end directed upwards; a vertical line drawn through its centre intersects the angle of the mouth. The latter is proportionally large; the tongue rather small, subelliptical, thickish, free posteriorly upon one-third of its length, and apparently entire. The inner nostrils are proportionally large, ovoid, and far apart. The openings of the Eustachian tubes are very conspicuous; in shape, like the inner nostrils, and nearly as

large. The vomerine teeth constitute two quite elongated groups, situated obliquely behind the inner nostrils; their posterior extremities approximate, though not contiguous, whilst anteriorly they would pass along the outer margin of the inner nostrils if extended thither.

The body is comparatively short, not quite the two-thirds of the length, the head included. The limbs are slender; the fingers and toes slender also, and terminated by comparatively small disks. The anterior legs, when brought backwards alongside with the body, do not extend beyond the groins. The articulations of the fingers are provided beneath with quite conspicuous tubercles. There are two metacarpal tubercles, one is elongated, situated at the base of the first finger, the other circular, in a medial line with the palm of the hand, which is subtuberculous. The hind legs are proportionally long, for, when brought forwards, half of the tarsus projects beyond the snout. The toes are subdepressed like the fingers, and provided with tubercles under their articulations. The sole of the feet is smooth. A conspicuous metatarsal tubercle exists at the base of the first toe, and a very indistinct one outside of it.

The color, as preserved in alcohol, is uniform blackish-brown, lighter beneath.

Collected at Rio de Janeiro, Brazil.

Plate III, fig. 24, represents *Hylodes parvus*, size of life.
Fig. 25, is a side view of the head.
Fig. 26, an upper view of the same region.
Fig. 27, under surface of the left hand.
Fig. 28, under surface of the left foot.

Genus ELOSIA, Tsch.

Gen. Char.—Snout obliquely truncated. Vomerine teeth disposed upon two groups, situated behind the inner nostrils. Tongue large, subcircular or subelliptical, posteriorly entire, and adhering by most of its under surface. Tympanum distinct. Eustachian tubes small. Fingers free. Toes webbed at their base. Subdigital disks moderate. Abdomen smooth.

Syn.—*Elosia*, Tsch. Mém. Soc. Sci. nat. Neuch. II, 1838, 77.—Dum. & Bibr. Erp. gén. VIII, 1841, 632.

1. Elosia nasuta, Tsch.

(Plate IV, figs. 39–43.)

Spec. Char.—Eyes large and prominent. Tympanum small. Legs slender and elongated. Skin above, smooth, with small pustules. Reddish-brown, maculated above; sides dotted.

Syn.—*Hyla nasus*, Licht. Verzeichn. Doubl. Zool. Mus. Berl. 1823, 106.—Fitz. N. Class. Rept. 1826, 63.

Elosia nasuta, Tsch. Mém. Soc. Sci. nat. Neuch. II, 1838, 36 & 77.—Dum. & Bibr. Erp. gén. VIII, 1841, 632.

Descr.—The head is a little longer than broad, and forms about the third of the length, the legs excepted. It is flattened above, and slightly declivous upon the snout, the terminal outline of which, when seen from above, is that of an obtuse triangle. The nostrils are subelliptical, and situated midway between the anterior rim of the orbit and the extremity of the snout, though on a profile view of the head they would appear almost terminal. The sides of the snout are somewhat concave along the line of the canthus rostralis. The eyes are large, subcircular, and prominent; their horizontal diameter being twice the distance between them and the nostrils. The upper lid is smooth; its outer margin is horny, and continued over the canthus rostralis. The tympanum is subcircular; its diameter being scarcely half that of the eye, that is to say, comprised twice along the distance between the eyes and nostrils. The mouth is proportionally large, and the tongue thickish, depressed, and subelliptical in its outline, a little narrower anteriorly, entire posteriorly, adhering by almost its whole under surface; the very margin alone, laterally and posteriorly, seemingly free. The vomerine teeth constitute two elongated and oblique groups, placed between the inner nostrils. The latter are subcircular and moderate in size. The openings of the Eustachian tubes are very conspicuous and nearly as large as the inner nostrils.

The limbs are long and slender. In stretching the anterior ones alongside the body, some of the fingers will extend beyond the posterior extremity of the body, while the posterior ones are longer than the body and head, by the entire foot. There is a large, flattened, meta-

carpal disk, and an elongated tubercle at the base of the inner finger. The tubercles under the articulations are found: one to the first and second fingers, and two to the third and fourth. The fourth finger is shortest; the second, a little longer than the first; the third, always the the longest of all. The toes are provided laterally with a membranous fold, and webbed at their base. Their articulations are provided beneath with small tubercles; one to the first and second toes, two to the third and fifth, and three to the fourth. The metatarsal tubercles are very small, and not always readily distinguishable, especially the outermost. The one situated at the base of the inner toe is more conspicuous, and has the shape of an elongated ridge rather than of a conical tubercle. A conspicuous, cutaneous fold exists along the inner side of the tarsus. The skin is perfectly smooth all over the head, body, and limbs, though the upper regions exhibit small pustules, especially the back. A membranous ridge may be seen over the upper margin of the tympanum.

The ground color above, is reddish-brown; the body and head, maculated with small spots and dots of a deeper brown extending all over the head, snout, and jaws. These spots are much larger on the legs, assuming upon the hind ones the shape of transverse bands. The sides of the abdomen are dotted with white, and these white dots extend somewhat posteriorly over the thighs. The inferior surface of the head and chest is whitish; the limbs, beneath, being reddish.

A small individual exhibits much larger, not confluent, spots on the back.

The specimens are from Rio de Janeiro, Brazil.

Plate IV, fig. 39, represents *Elosia nasuta*, size of life.
Fig. 40, is a side view of the head.
Fig. 41, an upper view of the head.
Fig. 42, under surface of the left hand.
Fig. 43, under surface of the right foot.

2. Elosia bufonium, Grd.

(Plate IV, figs. 23–27.)

Car. spec.—*Oculis magnis et eminentibus. Tympano modico. Cute*

laevi, sine pustulis. Supra fuscata, maculata ; infra vermiculata vel unicolori.

Spec. Char.—Eyes large and prominent. Tympanum moderate. Legs small. Skin smooth, without pustules. Dusky-brown, dotted; beneath, vermiculated or unicolor.

Syn.—*Elosia bufonium,* Grd. in Proc. Acad. Nat. Sci. Philad. VI, 1853, 423.

Observ.—The physiognomy of this species is widely distinct from that of *Elosia nasuta*, though both species are closely allied by their structure. The first trait which strikes most in their differentiation consists in the shortness of its legs, which are, nevertheless, slender. Next it will be observed that the body is shorter, when compared to the head. The head itself is more bulky and its upper surface more inclined on the snout. The latter is more obtuse, more elevated, more inwardly truncated.

Descr.—The head, somewhat broader than long, forms more than the third of the length, the limbs excluded. The occipital region is convex- and the distance from the eyes to the snout very much inclined for, wards. The terminal line of the snout, seen from above, is that of an obtuse triangle, still more open than in *E. nasuta ;* the line of the canthus rostralis is also less concave. The nostrils, subcircular or subelliptical, are less prominent, though situated midway between the anterior margin of the eye and the extremity of the snout. The eyes, themselves, are large, subelliptical ; their horizontal diameter is twice the distance between them and the nostrils. The upper lid is smooth, but its horny margin does not extend along the canthus rostralis. The tympanum is of medium size, and its diameter greater than the radius of the eye, as is the case in the preceding species. The mouth is broad and large ; the tongue suborbicular, rather thin, especially upon its margin. The vomerine teeth constitute two small and oblong groups situated between the inner nostrils, and somewhat larger than in *E. nasuta.* The inner nostrils are subcircular, and also larger than in *E. nasuta.* The openings of the Eustachian tubes are smaller than the inner nostrils, though larger than in *E. nasuta.*

The legs are slender, but shorter than in *E. nasuta*, and the dilatations of the fingers and toes less developed. The forelegs, when

stretched alongside the body, scarcely reach its posterior extremity with the tip of the longest finger; the hind ones, from their insertion to the base of the metatarsus, equal the body and head in length. The fourth or outer finger is the shortest; the first is a little shorter than the second, and swollen upon its base. There is a subcircular and flattened metacarpal disk, and small tubercles may also be seen under the digital articulations; the palm of the hand is smooth. The tarsus is provided with a cutaneous ridge along its inner margin. The toes are slightly webbed at their base, and provided laterally with a very diminutive membrane; the third is longer than the fifth. The sole of the feet is smooth; there are two metatarsal tubercles, the innermost minute and conical, the other situated at the base of the first toe, is larger and elongated. The articulations of the toes exhibit a small tubercle beneath.

The skin is perfectly smooth throughout, without the slightest trace of pustules or asperities. The body, head, and snout are dusky-brown, with dots of a deeper brown and of white, irregularly spread all over, the white dots forming an indistinct series on each side of the abdomen. On the posterior portion of the back the white spots have a black dot in their centre. An elongated, quadrangular spot of deep-brown on the middle of the upper jaw, obliquely situated under the anterior half of the orbit. A deep-brown vitta on the canthus rostralis. A patch of the same color on the tympanum, extending backwards, tapering towards the shoulder. The inferior surface of the head and belly are yellowish-white, vermiculated with chestnut-brown. The legs and feet are reddish-brown, unicolor beneath, maculated above with deep-brown patches, largest upon the thighs.

We consider as the male of this species a smaller individual, uniformly dusky-brown above, indistinctly maculated upon the thighs. The inferior surface of the head and belly is uniform yellowish-white, and the legs beneath light reddish-brown. The tympanum being also proportionally larger. The first finger is provided above with a double series of very small, conical, and horny, black tubercles, the inner series composed of three, the outer series of but two or one only.

Specimens were collected at Rio de Janeiro, Brazil.

Plate IV, fig. 23, represents *Elosia bufonium*, size of life.
Fig. 24, is a side view of the head.

Fig. 25, an upper view of the head.
Fig. 26, under surface of the right hand.
Fig. 27, under surface of the right foot.

3. Elosia vomerina, Grd.

(Plate IV, figs. 17–22.)

Car. spec.—*Oculis tympanoque modicis. Cruribus longis et tenuibus. Cute laevi sine pustulis. Supra fuscata, postice maculata. A latere linea fusca.*

Spec. Char.—Eyes and tympanum moderate. Legs long and slender. Skin smooth, without pustules. Dusky-brown above, posteriorly maculated. A lateral, deep-brown band.

Syn.—*Elosia vomerina*, Grd. in Proc. Acad. Nat. Sci. Philad. VI, 1853, 423.

Observ.—It is not without hesitation that we have placed this species in the genus *Elosia*, on account of the peculiar disposition of the vomerine teeth. Considering, however, the shape of the head, the structure of the feet and toes, we have preferred to associate it with the species described above until further investigations shall have been made into the Herpetology of South America.

Descr.—The head, a little broader than long, forms about the third of the length, the legs excluded. It is subconcave, or flattened upon its upper surface, with a very slight declivity towards the snout. The latter is nearly rounded, its terminal outline forming a very open triangle. The nostrils are small and subcircular, placed a little nearer the tip of the snout than the anterior rim of the orbit. The eyes are large and subelliptical; their longitudinal diameter being equal to the rostral distance in advance of their anterior rim. The upper lid is smooth, and its margin not prolonged over the canthus rostralis. The tympanum is proportionally larger than in the preceding two species, and its diameter is equal to the distance between the eye and the nostril. The tongue is subcircular, discoid, broadly emarginated posteriorly, where it is free for about one-fourth of its length; its edges are free also. The vomerine teeth, situated between the inner nostrils,

are disposed upon a transverse and rectilinear series, immediately in advance of the anterior margin of the latter openings, and widely interrupted in the middle. The inner nostrils, themselves, are subcircular, proportionally smaller than in the preceding species. The openings of the Eustachian tubes are smaller than the latter, but quite distinct.

The body is elongated, raniform, broader than deep, narrowest posteriorly, and continuous anteriorly with the head.

The limbs are slender, intermediate in length between those of *E. nasuta* and *E. bufonium*. The dilatations of the toes and fingers are proportionally small, and in that respect more like *E. bufonium*, although the shape of the body be so widely different. The anterior legs, when stretched alongside the body, reach the posterior extremity of the trunk with the tip of their fingers. The posterior ones, when brought forwards in a similar manner, extend beyond the snout, of the whole length of the foot and half the metatarsus. The first finger is shorter than the second, both of which are provided with a subarticulary tubercle, whilst there are two of them to the third and fourth. The palm of the hand is inconspicuously tuberculous; a rather large, subspherical, or subconical tubercle may be seen upon its base. The base of the first finger is provided with a more elongated and smaller tubercle. The toes are slightly webbed at their base, and bordered with a membranous fold. The first toe, the shortest, has but one tubercle underneath; the others have each two. The sole of the feet is perfectly smooth; as to the metatarsal tubercles, the outermost is small and subconical, whilst the other is elongated, slightly raised, and resembles a rudimentary finger.

The skin is perfectly smooth throughout.

The ground color above, is fuliginous or yellowish-brown; the head and back provided with very obsolete spots, appearing almost unicolor, except on the posterior third of the body, where small blackish-brown spots are distinctly observed. Along the upper margin of the snout and over the rostral distance to the eye, there is a deep chestnut-brown or, mayhap, black vitta, which crosses the eye, passes above the tympanum, and extends along the back, to disappear entirely amidst the spots on the posterior third of the body. The tympanum itself is surrounded, and probably covered, by a deep-brown spot. A whitish narrow band extends from beneath the eye to the shoulder, in passing under the tympanum, where the band may be interrupted, leaving an

oblong or a circular, white spot on the shoulder. From beneath the angle of the mouth, a brownish streak extends to the arm. The legs are more distinctly maculated than the body, and upon the hind ones the blotches assume a transverse aspect, with intervening yellowish-white spots. The sides of the abdomen are greyish-brown, vermiculated with whitish. The inferior surface of the head and belly is dull yellowish-white, inconspicuously clouded; the legs beneath are uniform reddish-brown.

This species was collected about Rio de Janeiro, Brazil.

Plate IV, fig. 17, represents *Elosia vomerina*, size of life.
Fig. 18, is side view of the head.
Fig. 19, an upper view of the same region.
Fig. 20, the head, seen from beneath.
Fig. 21, under surface of the left hand.
Fig. 22, under surface of the left foot.

Fam. BUFONIDAE.

No teeth in the upper jaw, and none on the vomer. Tongue posteriorly rounded. Parotid glands generally extant. Extremities of fingers and toes tapering. Skin warty, never completely smooth.

Syn.—*Bufonoidea*, Fitz. Neue Class. der Rept. 1826, 39.
Bufoniformes, Dum. & Bibr. Erp. gén. VIII, 1841, 640.

Observ.—In this family, teeth are completely wanting; the tongue is never emarginated or bifurcated posteriorly, and in the genus *Bufo*, by far the most numerous in species, are to be observed the so-called parotid glands. In the latter genus, also, we find some species the toes of which are palmated; whilst in others they are entirely free, as is the case with the other genera, *Rhinoderma* excepted. As a general rule, the skin is warty or verrucose to a degree never observed in either Ranoids or Hyloids.

Genus RHINODERMA, Dum. & Bibr.

Gen. Char.—Tympanum hidden. No parotid glands. Tongue elon-

gated elliptical, free upon the third of its length, entire or emarginated. Eustachian tubes small. Fingers and toes depressed and tapering, the former with a rudimentary basal membrane, the latter, semi-palmated. A membranous projection of the snout. Males provided with a subgular vocal bladder.

Syn.—*Rhinoderma*, Dum. & Bibr. Erp. gên. VIII, 1841, 657.—Bell, Zool. Voy. Beagle, V, 1843, 47.

Observ.—This genus was instituted for a small species, collected in Chile, by Charles Darwin, during the voyage of H. M. Ship Beagle, under Captain Fitzroy. It is a fact of very great interest to find another species of the same genus on the Atlantic coast of South America, one specimen of which having been collected at Rio de Janeiro by the United States Exploring Expedition.

Rhinoderma signifera, Grd.

Car. spec.—*Plantarum digitis elongatis, a basi palmatis. Tuberculis sub digitorum articulis. Colore fusco rubescente, albo punctato. Cruribus posterioribus nigro fasciatis. Post occiput macula alba, elongata. Ocella lumbali elliptica, leucophæa. Abdomine maculato.*

Spec. Char.—Toes elongated, webbed upon their base. Tubercles under the articulations of fingers and toes. Color above, reddish, dotted with white. Hind legs barred with black. An elongated, white, post-occipital spot. An elliptical, greyish, lumbar ocella. Abdomen maculated.

Syn.—*Rhinoderma signifera*, Grd. in Proc. Acad. Nat Sci. Philad. VI, 1853, 424.

Observ.—The unique specimen of this species, preserved in the collections of the United States Exploring Expedition, being in a rather precarious state of preservation, the following description must necessarily remain incomplete, much to our regret.

Descr.—The general dimensions are about the same as in *R. darwini*, the head being comprised about twice in the length of the trunk. The head, itself, is conical, almost as long as broad, slightly convex

above, and, likewise, slightly declivous upon the snout, at the tip of which the nostrils are situated, and between which a slight groove may be traced to the occiput, along the middle line of the cranium. The membranous proboscis is almost dried up, and reduced to a knob upon the truncated part of the snout, in which state it resembles *Dendrobates*, except in being narrower. The inner nostrils are large, situated close to the maxillary, hence far apart from each other. The openings of the Eustachian tubes are very minute. The tongue appears to be quite elongated and entire posteriorly. The eyes are proportionally large, subelliptical, their longitudinal diameter being equal to the distance between the orbits and the end of the snout. The interocular space, on the other hand, is equal to their diameter. The tympanum is entirely hidden under the skin, and parotid glands are not extant. The body is slender and elongated, not in the least bufonine in its aspect, but rather recalling to mind the most slender forms of the ranine group. The legs are slender also, the anterior ones are shorter than the trunk. The fingers are united at their base by a rudimentary membrane; they are slender, their tip slightly swollen beneath, each articulation being protected by a small, rounded tubercle. The third finger is considerably the longest; the first a little longer than the second, which is almost equal to the fourth. The palm of the hand exhibits small tubercles or granules, and upon its base is seen a metacarpal, rounded knob. The posterior legs appear to hold the same relation towards the body and head, as in *R. darwini*, that is to say, if brought forward alongside of the body they would extend beyond the snout, by the whole length of the foot. The toes are slender and elongated, but slightly webbed at their base. Their structure is the same as the fingers; they are provided with small tubercles under their articulations, and their tip is swollen beneath. There are two quite conspicuous, metatarsal tubercles, the outer one being the largest, subcircular, and conical.

The skin is perfectly smooth all over. There are two ovoid, lumbar, proportionally large patches, one on each side, simulating the lumbar glands in *Pleurodema*, the surface of which is apparently smooth.

The ground color above is reddish, minutely dotted with white, the dots very much crowded on the sides of the abdomen, so as to give a rather milky appearance to that region. Just behind the occiput on the middle of the back may be seen an elongated and very regular whitish spot, twice as long as wide and rounded upon its extremities.

The lumbar patches are lighter, but upon their upper and posterior portion may be seen a jet-black, oblong spot, with a narrow light margin. A narrow black band commences behind the eyes, extends over the shoulders, and becomes wider as it spreads over the sides of the chest, but tapers towards the belly. A few transverse, jet-black bands are observed on the hind legs and one or two upon the anterior ones. Along the posterior, outer margin of the thighs, is a longitudinal, dark streak, with an upper, lighter margin. The head beneath, the chest, and the under parts of the legs, are reddish; the latter vermiculated with whitish. The belly is maculated with white and black.

This species was caught in the neighborhood of Rio de Janeiro, Brazil.

Genus BUFO, Laur.

Gen. Char.—Tympanum more or less distinct. Parotid glands present. Tongue elongated, elliptical, entire, or forked posteriorly, and more or less free. Eustachian tubes moderate. Fingers free; toes palmated or subpalmated. Males generally provided with a subgular vocal bladder.

Syn.—*Bufo*, Laur. Synops. Rept. 1768.—Dum. & B. Erp. gén. VIII, 1841, 662.—Wagl. Naturl. Syst. Amph. 1830, 206.

Observ.—The parotid glands and pustulous skin constitute the most characteristic features of the toads, properly so called. The fingers, four in number, and the toes, five, are depressed; the former being always free, whilst the latter are webbed to a greater or lesser degree. A horny process may likewise be observed at the base of the inner toe, and occasionally a second smaller one, outwardly.

1. Bufo boreas, B. & G.

(Plate VI, figs. 4–9.)

Car. spec.—*Capitis facie superiore plana; cute lævi, calvæ non adhærente. Glandulis parotidis modicis. Tympano exiguo. Plicatura membranea in tarso. Plantarum digitis palmatis. Supra viridi,*

cum vitta flavea dorsuali; pustulis rubescentibus. Infra albo sordido, nigro maculato.

Spec. Char.—Upper surface of head, plane; skin not adhering to the skull and smooth. Parotids moderate. Tympanum small. A membranous, tarsal fold. Toes palmated. Green, with a dorsal, yellow vitta; pustules reddish. Beneath, of a soiled white, maculated with black.

Syn.—*Bufo boreas*, B. & G. in Proc. Acad. Nat. Sci. Philad. VI, 1852, 174.—Grd. in Proc. Acad. Nat. Sci. Philad. VII, 1854, 87.

Descr.—With a total length of two inches and three-tenths, we find that the head does not measure quite the third. The latter is very much depressed, flattened or plane above, showing neither ridges nor grooves, save a very shallow depression upon the middle of the snout. It is rounded and very declivous from the nostrils to the margin of the upper jaw, forwards and sideways. The interocular space, measured across the middle of the eyes, is equal to the width of the upper lid. The canthus rostralis is very slightly swollen; the nostrils are a little nearer the eye than the notch of the upper jaw. The horizontal diameter of the eye is equal to the distance between the anterior margin of the latter and the extremity of the upper jaw; the upper eyelid is warty; the warts, generally small, are sometimes more developed upon its internal periphery. Its external periphery is corneous and sharp. The tympanum is small, sometimes subcircular, at others subelliptical; its diameter is less than half that of the eye. The parotids are moderate in size, and subreniform in shape, situated horizontally above the shoulders, anteriorly close to the orbit, and contiguous exteriorly to the tympanum. Their surface is smooth anteriorly, whilst posteriorly it exhibits small warts or tubercles. The pores are small and numerous.

The mouth is large and the upper jaw emarginated. The tongue is rather narrow and elongated, ovoid in its outline, and free upon the posterior third of its length. The inner nostrils are distant, situated close to the jaw, subtransverse and oblong in shape. The openings of the Eustachian tubes are much smaller than the inner nostrils.

The limbs are well developed, although of a slender appearance. The fingers are depressed and tapering to a point; the first is longer

than the second, which is the shortest. The articulations of the phalanges are provided beneath with tubercles of moderate development. Their inferior surface is otherwise smooth, except a few scattered granules, which may be observed on the palm of the hand. The central metacarpal disk is large and subcircular. The inner one, occupying the base of the first finger, is very conspicuous and proportionally more developed than in any other North American species of the genus. The hind limbs are longer than the body and head together, of the whole length of the foot. The toes, themselves, are subdepressed, tapering, and webbed to their very tip, the membrane being but slightly emarginated. The tubercles under the articulations of the phalanges are but a little larger than the granules, which are spread over the sole of the feet. The inner metatarsal process is subconical and well developed; the outer one is quite depressed upon a broad base. The metatarsus beneath is granular, and its inner lower edge provided with a conspicuous membranous fold.

The skin above is covered with large pustules or small perforated glands, secreting a viscous fluid, analogous to that secreted by the parotids. On the anterior region of the body there is a tendency of these glands to arrange themselves upon a double series, one on each side of the dorsal line, slightly converging towards the occiput, hence diverging towards the upper eyelid, where they unite with the series above alluded to, as occupying the inner border of that organ. The intervening space between the pustules is warty, verrucose, or subtuberculous. Underneath, the warts are very crowded and large. The anterior limbs are smooth above, warty anteriorly and beneath. The posterior ones have the same appearance as the upper surface of the body. The upper part of the foot and the anterior part of the tarsus and tibia are smooth. The snout, the sides of the head, and interocular space are perfectly smooth.

The ground color is of an intense green, with a yellow dorsal vitta, extending from the interocular space to the posterior extremity of the body. A yellow tint, sometimes intermingled with a reddish hue, predominates over the limbs, especially the hind ones. The parotids, the pustules, and the glandulæ, are reddish. The inferior surface of the body is of a soiled white, maculated with black; under the head and thighs, unicolor, dull-yellowish. The interdigital membrane being purplish.

Specimens of this species were collected up Puget Sound, Oregon, in May, 1841. A sketch from life was made at the same epoch.

Plate VI, fig. 4, represents *Bufo boreas*, size of life.
Fig. 5, is a side view of the head.
Fig. 6, an upper view of the head.
Fig. 7, the head, seen from beneath.
Fig. 8, the under surface of the right hand.
Fig. 9, the under surface of the left foot.

2. Bufo columbiensis, B. & G.

(Plate V, figs. 4–9.)

Car. spec.—*Capitis facie superiore plana. Cute calvae adhaerente et granulata. Glandulis parotidis parvis. Tympano parvo. Plicatura membranea in tarso. Plantarum digitis palmatis. Supra virides-cente, cum maculis nigris et punctis rubescentibus. Vitta alba dorsuali. Sub oculo macula obliqua. Infra flavo sordido, maculato.*

Spec. Char.—Upper surface of head plane. Skin adhering to the skull and granulated. Parotids small. Tympanum small also. A membranous tarsal fold. Toes palmated. Light-greenish, with black blotches and reddish spots. A dorsal, white vitta. An oblique, dark patch beneath the eye. Inferiorly, of a soiled yellow, maculated.

Syn.—*Bufo columbiensis*, B. & G. in Proc. Acad. Nat. Sci. Philad. VI, 1853, 378.—Grd. in Proc. Acad. Nat. Sci. Philad. VII, 1854, 87.

Observ.—The characters by which this species can be distinguished from *B. boreas*, consist in the comparative length of the forearm, arm, and hand, which are almost equal in length in *B. columbiensis*, whilst in *B. boreas*, the forearm is longer than either the arm and the hand; both pairs of limbs are longer too, and, in the posterior pair, the foot is the region which is the most developed. The membrane which unites the toes is more deeply emarginated in *B. columbiensis* than in *B. boreas*; the inferior surface of the hands and feet is conspicuously granulated in the former, and nearly smooth in the latter. In *B. columbiensis* the

skin upon the head is rather thick, granular, and adhering to the skull, whilst in *B. boreas* it is thin, loose, and smooth. The parotid glands are smaller in the species which we now describe.

Descr.—The entire length of the specimen figured, the only one apparently full-grown amongst those collected, is a little more than three inches and a half, the head constituting nearly the fourth of that length. Viewed from above, the head is subtriangular, broader than long, the snout being almost abruptly truncated, another feature which will distinguish this species from *B. boreas*. Its upper surface is slightly depressed, without any ridges or groove, but densely covered with small tubercles. The interocular space, measured across the middle of the eyes, is greater than the greatest width of the upper lid, whilst it is equal to it in *B. boreas*. The canthus rostralis is slightly swollen; the nostrils, situated immediately beneath its anterior extremity, are much nearer to the orbit than to the notch of the upper jaw. The upper eyelid is tuberculous. The tympanum is quite small and subcircular. The parotids, rather small, elongated, narrowest anteriorly, are situated horizontally over the shoulders; they approximate anteriorly the eye and externally the tympanum; they are perforated with comparatively few, but large pores. The upper jaw is emarginated; the tongue large and elongated; the inner nostrils transversely oblong and small, and the openings of the Eustachian tubes much smaller still.

The limbs are very long and of slender appearance. The fingers are stout, subdepressed; the tubercle under their first articulation is the only one well developed. The palm of the hand and under surface of the fingers are rugose and tuberculous. The central metacarpal disk is large, rounded, and depressed; the inner one being much the smallest, scarcely larger than the subarticulary tubercle of the inner finger. The first, second, and fourth fingers are almost equal in length; the third is, as usual, the longest. The hind limbs are somewhat longer than the body and head together; they are, as already alluded to, shorter than in *B. boreas*. The toes are depressed, and the membrane, although extending to their tips, is nevertheless more deeply emarginated than in *B. boreas*. Tubercles may be seen under each articulation of the phalanges, although none are conspicuous. The soles of the feet is densely covered with small granules. The metatarsus, beneath, is also provided with small granules, and its inner and lower

edge with a membranous fold, less developed, however, than in *B. boreas*. The process at the base of the inner toe is very prominent and subconical. The second or outermost is less elevated.

The skin above, is provided with small glands or pustules, similar in structure to the parotids, being perforated with small pores. These glandulæ, however, are smaller than in *B. boreas;* the largest are observed upon the hind limbs. In *B. columbiensis*, these small glands are irregularly scattered all over the surface of the body. The intermediate space is covered with small warts and granules. The upper part of the fore limbs and hands, the inferior surface of the thighs, the tarsus all around, and the feet above, are covered with a minute granulation. Beneath, the skin is warty, the warts being more apparent under the belly than under the legs, chest, and head.

The ground color is light-greenish; a dorsal, white vitta extends from the occiput to the posterior extremity of the body. Large, irregular patches of brownish-black are observed over the upper region of the body and limbs, confluent on each side of the dorsal vitta, and also upon the flanks, assuming the shape of transverse bars on the legs, where they are larger than elsewhere. The papillæ, the parotids, the warts, the granules, and tubercles are reddish. The upper surface of the head is yellowish-brown, and its sides green. Tympanum blackish, with spots all around it. The margin of the jaws is whitish. An oblique, elongated, black patch may be seen under the anterior part of the eye, extending from the margin of the upper jaw, obliquely upwards and forwards. A small black spot covers the nostrils, and another may be observed under it, upon the middle of the snout, whilst a third one is seen occupying the margin of the upper jaw, between the latter two. The iris is reddish-orange. The inferior surface is dull-yellowish or whitish, maculated with blackish under the chest, sides of belly, and under the limbs.

In very small and immature specimens many of the characters ascribed to this species are already conspicuous. The web of the toes appears to be still less developed than in *B. boreas*.

Specimens were collected on Columbia River, Oregon. Drawn from life.

Plate V, fig. 4, represents *B. columbiensis*, size of life.
Fig. 5, is a side view of the head.

Fig. 6, an upper view of the head.
Fig. 7, the head, seen from beneath.
Fig. 8, under surface of the right hand.
Fig. 9, under surface of the right foot.

3. Bufo marinus, Schn.

(Plate V, figs. 1–3, and Plate VI, figs. 1–3.)

Spec. Char.—Upper surface of head depressed in the middle, and provided with ridges. Skin adhering to the skull. Parotids varying in size. Tympanum moderate. A tarsal, horny ridge. Toes semipalmated. Color variable.

Syn.—*Rana marina americana*, Seba, ... I, ... 120, Tab. lxxvi, fig. 1.

Rana marina, Linn. Syst. Nat. edit. X, I, 1758, 210, et ed. XII, I, 1766, 356.—Gmel. *Linn.* Syst. Nat. I, iii, 1788, 1049.—Laur. Synops. Rept. 1768, 31.

Bufo agua, Latr. Hist. nat. Rept. II, 1801, 13, fig. 1.—Daud. Hist. nat. Rept. VIII, 1803, 209; et Hist. nat. Rain. Gren. Crap. 1803, 99, Pl. xxxvii.—Cuv. Règn. anim. II, 1817, 97, et 2de édit. 1829, 111.—Spix, Spec. Nov. Test. Ran. Bras. 1824, 44, Tab. xv.—Wied, Reise nach Bras. I, 1820, 52, & II, 1821, 241, et Rec. Pl. Col. Anim. Brés.; & Beitr. Naturg. Bras. I, 1825, 551.—Tsch. Mém. Soc. Sci. nat. Neuch. II, 1838, 88.—Dum. & Bibr. Erp. gén. VIII, 1841, 703.

Bufo horridus, Daud. Hist. nat. Rept. VIII, 1803, 201; et Hist. nat. Rain. Gren. & Crap. 1803, 97, Pl. xxxvi.

Bufo humeralis, Daud. Hist. nat. Rept. VIII, 1803, 205.

Bufo maculiventris, Spix, Spec. Nov. Test. Ran. Bras. 1824, 43, Tab. xiv, fig. 1.

B. lazarus, Spix, Spec. Nov. Test. Ran. Bras. 1824, 45, Tab. xvii, fig. 1.

B. stellatus, Spix, Spec. Nov. Test. Ran. Bras. 1824, 46, Tab. xviii, fig. 1.

B. scaber, Spix, Spec. Nov. Test. Ran. Bras. 1824, 47, Tab. xx, fig. 1.

B. albicans, Spix, Spec. Nov. Test. Ran. Bras. 1824, 47, Tab. xviii, fig. 2.

B. icterus, Spix, Spec. Nov. Test. Ran. Bras. 1824, 44, Tab. xvi, fig. 1.—Gravenh. Delic. Mus. Zool. Vratisl. I, 1829, 54.

B. ornatus, Spix, Spec. Nov. Test. Ran. Bras. 1824, 45, Tab. xvi, fig. 2.—Gravenh. Delic. Mus. Zool. Vratisl. I, 1829, 61.

B. marinus, Schn. Hist. Amph. I, 1799, 219.—Merr. Tent. Syst. Amph. 1820, 182.—Gravenh. Delic. Mus. Zool. Vratisl. I, 1829, 54.

Bombinator horridus, Merr. Tent. Syst. Amph. 1820, 179.

Lépaule armée, Daub. Dict. anim. vertébr. 1790, 624.—Lacep. Hist. quadr. ovip. I, 1789, 539.

La grenouille épaule armée, Bonnat. Ency. méth. Erpét. 1789, 6, Pl. iii, No. 2.

Marine toad, Shaw, Gen. Zool. III, i, 1802, 155, Pl. xliv.

OBSERV.—There is perhaps no species of the bufonine group which has been described under the same variety of specific names as the present one. Besides the unusual variations observable upon individuals of nearly the same size and age, differences occur between individuals at different ages of growth. The most striking of these differences consist in the variation in the shape of the parotid glands: rhomboidal, sometimes nearly as wide as long, at other times more than twice as long as broad, and tapering posteriorly into a somewhat acute angle. They may further assume an elliptical shape, from twice or three times as long as broad. These bodies, in the three desiccated specimens brought home by the Expedition, exhibit a subelliptical shape, the length of which is a little more than twice their width. Other differences, comparatively superficial, are observed in the coloration, of which we speak below, having a few more remarks to make with regard to structure.

DESCR.—To whatever extent the variations just alluded to may go, it will always be easy to recognize the marine toad (*B. marinus* or *agua*), by the structure of the upper surface of its head, upon the middle of which a broad depression, tapering forwards and widening behind, may be seen. It is limited anteriorly and laterally by a conspicuous ridge, constituting an acute angle, extending from the tip of the snout to the eyes. The ridge thence extends over the eyes, slightly diverging from the medial line of the cranium, and passing behind the orbit, to meet a subcrescentic and transversal ridge, situated above the tympanum. In advance of the eye, and extending vertically over the line of the canthus rostralis, a similar swollen ridge exists, being connected above with the supra-orbital one. Thus, the eyes are surrounded superiorly, anteriorly, and posteriorly with an elevated ridge. The cephalic groove, posteriorly, is even with the surface of the body. Occasionally, a swelling may be observed, extending from the posterior curve of the lateral ridge obliquely towards the occiput, the surface of which is striated or furrowed. The snout is almost perpendicular in front; the nostrils are situated immediately beneath the ridge. The eyes are large, almost circular. The tympanum, though conspicuous, is comparatively of moderate size, ovoid, or subcrescentic, oblique. The parotid glands, anteriorly contiguous to the supra-tympanic ridge, extend over the shoulders, a little obliquely downwards.

Their thickness gives quite a broad appearance to that part of the body; the pores are not numerous and far apart.

The body is subelliptical, longer than broad. The limbs are well developed. The first finger is longer than the second, which is the smallest; the third is the largest; the fourth resembles the first. The dried state of the specimens did not allow a further study of the toes.

All over the upper part of the body and limbs are scattered glandulous tubercles of various sizes. Generally a double series, larger than the rest, are observed on the dorsal region. On the sides of the abdomen they are also more conspicuous. These tubercles are either smooth or provided with small spines, which, in the latter case, give the animal a somewhat rougher appearance. Beneath, the skin is always smooth, though wrinkled or folded in an irregular meshwork.

The ground color of the largest specimen is yellowish-white, mottled with black or brownish-black. Two elongated patches of black extend from the head to the posterior extremity of the body, along the back, leaving free a dorsal medial area of the ground color. The upper surface of the limbs is mottled. The upper surface of the head, the ridges, and the margin of the jaw, are brownish-black. The parotids exhibit a bluish reflection over the general tint. Beneath, the color is dull yellowish-white.

Another variety of coloration exhibits a brownish-green ground, with dark spots over the body, each of which spots as well as the intermediate spaces, being filled with smaller spots. The eyes and tympanum are emerald-green. The specimens exhibiting this variation of color have the skin studded with small asperities, whilst in the former it is quite smooth.

Procured at Rio de Janeiro, December, 1838, near the coast, and sketched from life.

Plate V, fig. 1, represents *Bufo marinus*, size of life.
Fig. 2, is the under surface of the left hand.
Fig. 3, the under surface of the right foot.
Plate VI, fig. 1, represents another variety of the same species.
Fig. 2, being the right hand, seen from beneath.
Fig. 3, the under surface of the right foot.

4. Bufo gracilis, Grd.

(Plate VI, figs. 16–21.)

Car. spec.—*Capitis facie superiore concava. Glandulis parotidis exiguis. Tympano magno. Plicatura membranea in tarso. Plantarum digitis subpalmatis. Cute granulata. Supra fusco-flavescente, cum vitta flavea dorsuali; dorso et cruribus hic illic maculatis. Infra luteo.*

Spec. Char.—Upper surface of head concave. Parotids exiguous. Tympanum large. A membranous, tarsal fold. Toes subpalmated. Skin granular, yellowish-brown above; a dorsal, yellow vitta; back and limbs irregularly spotted. Beneath dull-yellow.

Syn.—*Bufo gracilis*, Grd. in Proc. Acad. Nat. Sci. Philad. VI, 1853, 424.

Observ.—The physiognomy of this species partakes more of the ranine group than the following one, having a more elongated body and a proportionally smaller head. The limbs, however, appear as if cast in the same mould, being slender and elongated, and the toes but slightly palmated. The parotids, likewise, are small, but more exiguous, and the tympanum greater. The lateral glandulous stripe is a feature which *B. lugubrosus* does not possess. In regard to the head, it is the same sharp snout, and terminal situation of the nostrils; the same depression and ridges of the skull, and the body similarly warty, though the warts are proportionally smaller. This particularity of being provided with warts is common to many species of toads, and does, therefore, not constitute a specific trait.

Descr.—The head forms about the two-sevenths of the entire length; it is nearly as long as broad, and seen from above, it is triangular; slightly truncated upon the snout, which is rather prominent, and obliquely inclining inwards, the upper part overhanging the lower. The nostrils are obliquely situated towards its extremity, beneath the canthus rostralis, which is but slightly apparent. The upper surface of the snout, from the eyes to its tip, is perfectly even, sloping forwards; the sides of the same are almost abrupt. The

interocular and postocular regions are broadly concave. The eyes are proportionally large and circular; their anterior rim is protected by a small ridge: a downwards continuation of the canthus rostralis. There is also a postocular ridge: a downwards continuation of the supra-orbital or supra-tympanic ridge. Their diameter is much greater than the distance between their anterior rim and the extremity of the snout. The upper lid is covered with small warts and granules. The tympanum is regularly elliptical, oblique, rather large, very distinct, but smaller than the eyes. The parotids constitute an elongated swelling, contiguous anteriorly to the supra-tympanic ridge, and posteriorly to a glandulous, abdominal, cutaneous fold, of which we shall say a few words further on. The mouth is large; the upper jaw emarginated; the tongue elongated, club-shaped, laterally and posteriorly free, anteriorly slightly bifurcated. The inner nostrils are very large and subcircular; the openings of the Eustachian tubes being rather small and inconspicuous.

The limbs, fingers, and toes, are still more slender than in the following species; the first finger is longer than the second, and but a little shorter than the third; the fourth is the shortest, and the most exiguous. The palm of the hand is granular, and the articulations of the fingers are provided beneath with small tubercles. There is a quite large, subcircular, metacarpal disk, and a small tubercle at the base of the first finger, but not conspicuous. The toes are but slightly webbed and subdepressed like the fingers. The sole of the feet is densely granular, and the tubercles under the articulations of the toes are small and conical. An elongated tubercle may be seen at the base of the inner toe, and two metatarsal ones, smaller and less conspicuous. The tarsus is provided internally with a membranous fold.

The skin on the head and dorsal region, properly so called, is minutely granular; on the sides of the abdomen the granulation is larger and more dense, intermingled with small papulæ or pustules. A cutaneous ridge may be traced from the parotids to the groins. The legs, themselves, down to the fingers and toes, are densely covered with granules, still more apparent than on the sides of the abdomen, but the pustules do not extend beyond the elbows and knees. The lower surface of the head, that of the body and legs, is densely studded with small granules, a little more conspicuously posteriorly than anteriorly.

The upper part of the head, back, and limbs is yellowish-brown; the limbs are somewhat darker, blotched with blackish. There is a narrow, yellow vitta extending from the occiput to the posterior part of the body. On each side of this vitta, and contiguous to it, we observe angular, black patches, some of which are quite large, others small, extending from the occiput to the posterior third of the back. The iris is golden-yellow; the tympanum deep-chestnut, and the surrounding space black. The parotids and the glandulous, lateral ridge, are yellowish. The sides of the abdomen are light-yellow, with blackish-brown mottlings immediately beneath the glandulous ridge.

This species has a general resemblance to *B. ornatus*, of Spix, also from Rio de Janeiro, but on comparison will appear sufficiently distinct from the latter.

One specimen was obtained at Rio de Janeiro, in December, 1838, and a drawing made from life by Mr. Drayton.

Plate VI, fig. 16, represents *Bufo gracilis*, size of life.
Fig. 17, is a side view of the head.
Fig. 18, an upper view of the head.
Fig. 19, is the head seen from beneath.
Fig. 20, under surface of the right hand.
Fig. 21, under surface of the left foot.

5. Bufo lugubrosus, Grd.

(Plate VI, figs. 10–15.)

Car. spec.—*Capitis facie superiore sulcata. Glandulis parotidis modicis. Tympano parvo. Plicatura membranea in tarso. Plantarum digitis subpalmatis. Cute glandulosa et granulata. Supra subnigro, maculato; infra candido-luteo.*

Spec. Char.—Upper surface of head grooved. Parotids moderate. Tympanum small. A membranous, tarsal fold. Toes subpalmated. Skin glandulous and granular. Bluish-black above, maculated. Beneath dull yellowish-white.

Syn.—*Bufo lugubrosus*, Grd. in Proc. Acad. Nat. Sci. Philad. VI, 1853, 424.

Observ.—The head and body of this species present a most bufonine appearance, whilst the limbs and toes would rather recall to mind a *Rana*, or better, a *Cystignathus*. If we add that it is possessed of large and circular eyes, and that the body is covered with conspicuous warts, its physiognomy will assume a combination of both the bufonine and ranine groups.

Descr.—The head is much broader than long, maintaining its width towards the snout, the periphery of which is rounded. Its surface is concave, from the occiput to the extremity of the snout, assuming the aspect of an open groove, broadest posteriorly, tapering anteriorly, and bordered laterally by the canthus rostralis and a slight ridge along the inner edge of the orbit; upon the occiput the groove is even with the surface of the body. The canthus rostralis, itself, is well developed, and by the union of the two ridges upon the snout, constitutes a prominence, beneath which and close to the end of the snout, are situated the oblique and elongated nostrils. Just in advance of the eye, the canthus rostralis is considerably swollen into a kind of pyramid, whence a ridge extends downwards to near the inferior rim of the orbit. There is also a prominent, postocular ridge. The eyes are very large, circular; their diameter is greater than the distance between their anterior rim and the extremity of the snout. The upper lid is thick and covered with warts and granules. The interocular space, measured across the middle of the eyeball, is nearly equal to the rostral distance in advance of the eye. The parotids are of medium size, subelliptical, contiguous to the postocular ridge, and overlapping the tympanum as much as the ridge itself. The pores are minute and crowded, and the surface of the gland is covered with granules, more conspicuous than the pores themselves. The tympanum is proportionally small, occupying a kind of depression, which is rendered more apparent by the elevation of the postocular ridge and the projection of the parotids, though situated near the lower part of the side of the head. The mouth is very broadly cleft; the upper jaw is emarginated. The inner nostrils are very large and subcircular. The tongue is rather thin, narrowest anteriorly, where it is slightly bifurcated. The openings of the Eustachian tubes are comparatively small, but quite distinct.

The limbs are long and slender, and so are the fingers and toes. The first finger is longer than the second and almost as long as the

third; the fourth is but little shorter than the second. There are tubercles under the articulations, but the palm of the hand is smooth; there is a very large, subcircular, metacarpal horny disk, and a smaller, elongated one, at the base of the first finger. The toes are but slightly palmated; they are quite depressed, like the fingers. The first is, as usual, the smallest, and provided upon its base with an elongated tubercle; there are also two metatarsal horny disks, subcircular in shape. The articulations, beneath, exhibit each a tubercle, and the sole of the feet, small granules. The tarsus is provided along its inner edge with a thick membranous fold.

The skin has a quite rough appearance, owing to the presence of large pustules or warts, distributed all over the back, sides, and limbs, to the elbow and knees. These pustules are much larger and more prominent on the dorsal region, being small on the sides of the head, on the abdomen, and anterior part of the limbs. The whole upper surface of the head, body, and limbs throughout is minutely granular. The inferior surface of the body, head, and limbs has a rather smooth appearance; on the arms, thighs, and sides of abdomen the pavement-like warts are somewhat more conspicuous.

The head and dorsal region are of an apparently uniform bluish-black hue; reddish-grey upon the sides; a black patch on the tympanum; a black vitta on the sides of the abdomen, and black patches on the limbs; the fingers and toes being reddish. The inferior surface is of a soiled yellowish-white.

The specimen, as preserved in alcohol, has been much contracted by the liquid. As to the color, it is described from the sketch made from life by Mr. Drayton, in January, 1839. In alcohol, the ground color appears now yellowish-green, maculated or clouded with black.

Obtained at Valparaiso, Chile.

Plate VI, fig. 10, represents *Bufo lugubrosus*, size of life.
Fig. 11, is a side view of the head.
Fig. 12, an upper view of the head.
Fig. 13, the head, seen from beneath.
Fig. 14, under surface of the left hand.
Fig. 15, under surface of the right foot.

6. Bufo thaul, Less.

(Plate V, figs. 15–19.)

Spec. Char.—Upper surface of head even; canthus rostralis swollen. Parotids moderate. Tympanum small. A membranous tarsal fold. Toes semi-palmated. Skin tuberculous, greyish-brown above, spotted. Beneath whitish, maculated.

Syn.—*Bufo thaul*, Less. Voy. Coq. Zool. II, I, 1830, 63, Pl. VII, fig. 6. (Nec *Rana thaul*, Molina, Hist. de Chile, I, 1788, 194.)—Tsch. Faun. Peruan. Herp. 1845, 19.

Bufo chilensis, Dum. & B. Erp. gén. VIII, 1841, 678. (In part.)

Observ.—There is, perhaps, no species the synonymy of which is more intricate and more difficult to elucidate than the present one.

Rana thaul, of Molina (vid. Synonymy), is still wrapped up in obscurity, and ought to be made the subject of careful researches by either travelling or resident naturalists. Schneider (Hist. Amph. I, 1799, 227), refers it with doubt to the genus Bufo. Daudin (Hist. des Rain. Gren. & Crap. 69, & Hist. nat. des Rept. VIII, 136), and Merrem (Tent. Syst. Amph. 1820, 182), have copied Schneider. Lesson figures and describes, under the name of *B. thaul*, a species of toad widely distinct from *R. thaul*, of Molina. Tschudi, himself, seems to have understood the subject, since he omits the references anterior to Lesson's; but Tschudi ought to have given a new name to the present species, in order to avoid any further misunderstanding.

We must repeat here, what we have already stated under the head of *Pleurodema bibroni*, that the description of *B. thaul* in the letter-press of the Zoology of the "Voyage de la Coquille" is under the head of *B. arunco*. The references to the figures are likewise transposed.

Descr.—Out of nine specimens, collected by the Expedition, the largest was but one inch in total length, the legs excluded. The head is broader than long, subtriangular, flattened above, declivous on the snout, which is rounded. The canthus rostralis is well developed, sending downwards a small ridge in advance of the eye, which does not, however, extend as far as the inferior rim of the orbit. The nostrils

are obliquely situated towards the upper surface of the snout, immediately beneath the canthus rostralis, almost terminal. The eyes are prominent, though not very large; their horizontal diameter is nearly equal to the rostral distance in advance of the orbit.

The margin of the lid is thick, and densely covered with granules, a series of which may be observed along its outer edge. The tympanum is subcircular, distinct, and rather small. The parotids are very much swollen, subcircular in shape, prominently extending over the upper rim of the tympanum. The upper jaw is very slightly emarginated; the tongue is oblong, narrowest anteriorly and bifurcated, whilst it is entire and rounded posteriorly.

The fingers are provided with small tubercles under each of their articulations, and the palm of the hand with granules. The metacarpal tubercle is large, rounded, and depressed; that at the base of the first finger is elongated and much the smallest. The membranous ridge along the inner margin of the tarsus is quite prominent, and almost contiguous to the outer metatarsal tubercle, at the base of the first and smallest toe. The toes themselves are semi-palmated, depressed, like the fingers, and provided with tubercles under their articulations; the sole of the feet being possessed with series of granules.

The whole upper region of the body is provided with small warts and minute granules, from the tip of the snout to the base of the metacarpus and metatarsus. The parotids are as thickly covered with them as any other region; they are less crowded on the sides of the head. The sides of the abdomen are provided with warts only, but larger than those on the back. The skin beneath is smooth, save the flattened glands common to many species.

The color above is uniform greyish-brown, with a few small yellowish spots upon the posterior region. Some of the specimens exhibit blackish patches over a greyish ground. In others the granules appear like yellow dots. The margin of the jaws, the sides of the head, and abdomen, show traces of black markings. The ground color beneath is white or yellowish-white; the abdomen is maculated with deep-black; sometimes the abdomen appears entirely black by the confluence of the blotches, leaving but few specks of the ground color.

From Valparaiso, Chile.

Plate V, fig. 15, represents *Bufo thaul*, size of life.
Fig. 16, is a side view of the head.
Fig. 17, an upper view of the head.
Fig. 18, under surface of the right hand.
Fig. 19, under surface of the right foot.

7. Bufo poeppigii, Tsch.

Spec. Char.—Upper surface of head plane. Parotids narrow and elongated. Tympanum very small. A membranous tarsal fold. Toes subpalmated. Skin pustulous. Reddish-brown above, maculated. Beneath white, with a medial black line.

Syn.—*Bufo poeppigii*, Tsch. Faun. Peruan. Herp. 1845, 71.

Observ.—The only batrachian which fell within the reach of the Expedition, while on the coast of Peru, is a small toad, one inch and a quarter in length, and which answers to the species described in the "Fauna Peruana," under the name of *B. poeppigii*, which appears to be a rather small species. The specimen before us is smaller than the one described by Tschudi.

Descr.—The head is subpyramidal, when seen from either above or below. In profile it resembles more a flattened disk. The upper surface is almost plane, from the occiput to the tip of the snout, which is prominent and vertically truncated. The oblique nostrils are situated towards the upper part of the extremity of the snout, from which extremity it is only separated by a small protuberance, which gives to the snout its prominent feature. There is no canthus rostralis distinct from the surface of the snout. Behind the nostrils, and obliquely situated on the sides of the snout, may be seen a shallow depression. The eyes are proportionally large; their diameter being greater than the distance between the anterior rim of the orbit and the extremity of the snout. The upper lid is covered with small granules, similar to, but somewhat larger than, those seen on the head. The upper jaw is slightly emarginated. The tongue is elongated, subhemi-

spherical. The inner nostrils are very conspicuous, and quite distant from each other. The tympanum is very small, vertically subelliptical, and inconspicuous. The parotids are very narrow, elongated, extending beyond the insertion of the anterior limbs, and tapering off backwards into a series of small glands, along the sides of the abdomen.

The limbs, themselves, are proportionally small and slender. The anterior ones, when brought alongside the abdomen, reach the region of the groins with the extremity of the fingers, whilst the hind ones are equal in length to the body and head together. The first finger is conspicuously longer than the second; the fourth is the slenderest and shortest of all; the third, as usual, is the longest. Tubercles exist under each articulation, and granules under the palm of the hand. There is a very large subcircular, metacarpal tubercle, and another much smaller and elongated one at the base of the first finger. The toes are slender and but slightly palmated; the third is a little longer than the fifth. Their articulations are, likewise, provided underneath with small tubercles, and the sole of the feet is covered with granules. Of the two metatarsal tubercles, the inner one is the most conspicuous, and contiguous to the membranous ridge along the inner margin of the tarsus.

The skin is provided with small pustules and granules, extending all over the upper parts of the head, body, and limbs. Pustules, alone, are to be seen on the sides of the abdomen, under the thighs, head, and belly; the latter appearing almost smooth.

The ground color above is reddish-brown, with a medial, dorsal, indistinct, black line. A pair of subtriangular brownish-black spots, one on each side of the posterior part of the head, extending over the upper lid. An oblique narrow patch behind each eye. Larger and irregular patches of the same color are disposed on each side of the back (two pairs in our specimen), intermingled with small spots. A brownish-chestnut band may be seen on the line of the canthus rostralis, from the eye to the tip of the snout. In advance of the eye, and extending across the middle of the upper jaw to its margin, is seen a black band, directed obliquely forwards. From the eye to the shoulder, and across the tympanum, extends a large, subquadrangular, black patch, connected with a narrow, lateral vitta, extending from the shoulder to the groins. The side of the abdomen, beneath the vitta, is dotted with greyish-black. Patches of brownish-black or

chestnut are observed on the upper surface of the limbs, much more conspicuously posteriorly than anteriorly. The inferior surface appears as if washed with yellowish-white; a black line may be observed along the middle of the belly.

Obtained on the coast of Peru.

8. Bufo melanostictus, Schn.

(Plate V, figs. 10–14.)

Spec. Char.—Upper surface of head ridged; canthus rostralis elevated. Parotids large. Tympanum moderate. Membranous tarsal fold. Toes semi-palmated. Skin pustulous. Reddish-brown above; reddish-yellow beneath, dotted with black.

Syn.—*Bufo melanostictus*, Schn. Hist. Amph. I, 1799, 216.—Gravenh. Delic. Mus. Zool. Vratisl. Amph. 1829, 57.

Bufo scaber, Daud. Hist. nat. Rept. VIII, 1803, 194; et Hist. nat. Rain. Gren. & Crap. 1803, 94, Pl. xxxiv, fig. 1.—Latr. Hist. nat. Rept. II, 1801, 134.—Tsch. Mém. Soc. Sci. nat. Neuch. II, 1838, 88.—Dum. & B. Erpét. gén. VIII, 1841, 699.

Bufo bengalensis, Daud. Hist. nat. Rept. VIII, 1803, 197; et Hist. nat. Rain. Gren. & Crap. 1803, 94, Pl. xxxv, fig. 1.

Bufo carinatus, Gray, Illustr. Ind. Zool. I, 1832, Pl. lxxxiii, fig. 1.

Bufo dubia, Gray, Illustr. Ind. Zool. I, 1832, Pl. lxxxiii, fig. 2.

Crapaud du Bengale, Less. Voy. de Bélanger, Ind. Orient. Zool. 1834, 335.

Observ.—The few specimens of this species, caught at the southern extremity of the Peninsula of Bengal, being immature, it is but after a long and protracted examination and comparison with the descriptions of the writers upon this subject that we have come to their identification. The task has proved the more difficult as we lack an accurate figure of the adult animal. The only one extant is given by Daudin, under the name of *B. bengalensis*, which is identical with *B. scaber*, figured by the same author, but so poorly as to render it of no avail in a critical point of view.

In order to afford naturalists the means of identifying with accuracy the species now before us, we have caused figures to be made, although the specimens are immature. Should we have mistaken

their true affinities or relationships, any error in that respect will be more readily corrected than from our description alone.

Upon a careful examination of Plate LXXXIII, of the "Illustrations of Indian Zoology," it will clearly appear that the figures of *Bufo carinatus* and *B. dubia*, are identical with *B. melanostictus* of Schneider, or *B. scaber* of the French herpetologists. The general shape of the body and head are most strikingly alike, as also the granulation of the skin and pattern of coloration. In *B. carinatus*, indeed, the warts are less developed; but similar variations are of frequent occurrence, and, in this case, could not be considered as a specific difference.

DESCR.—The head, viewed from above, is triangular, almost as long as broad, its sides being very declivous. The snout is truncated, almost abruptly. The nostrils are lateral, nearly terminal, immediately beneath the canthus rostralis. The upper surface of the head is slightly concave; from the tip of the snout, a double ridge, the canthus rostralis, extends, diverging to the eyes, hence, obliquely down in front of the orbit, to terminate half-way to the angle of the mouth. A similar ridge is observed along the upper rim of the orbit, connecting the canthus rostralis, at the place where the latter turns downwards in front of the eye, and extending obliquely behind the eye, to pass in advance of the tympanum, after having sent off a rather thick branch to the parotid glands, immediately across the upper edge of the tympanum. The upper lid is covered with minute granuliform glandulæ. The tympanum is subcircular or vertically ovoid. The upper jaw is very slightly emarginated, and the lower one exhibits, upon its symphysis, a small knob.

The parotid glands are rather narrow and elongated, rounded at both extremities, extending beyond the shoulders, and slightly convex inwardly. Small granules are irregularly spread over their surface; the pores being seen between the granules, and a good deal smaller than the latter.

The limbs are rather long and slender; the first finger, which is as long as the fourth, is a little longer than the second; the third is the longest. The toes are semi-palmated. There are two tubercles at the base of the carpus; the inner one being the smallest. Minute granules exist on the inferior surface of the fingers and toes, more conspicuously than upon their upper surface. The tarsus has, likewise, two tubercles

at its base, and the innermost is also the smallest. The tips of the fingers and toes are horny, oftentimes black. Granules or tubercles cover the whole upper surface of the body and limbs, with a double dorsal series of quite large pustules, sometimes not very conspicuous.

The color, as preserved, is of a uniform reddish-brown above, and reddish-yellow beneath, with small black dots on the chest, margin of jaws, and under surface of the limbs.

Specimens were collected at Singapore.

Plate V, fig. 10, represents *Bufo melanostictus*, size of life.
Fig. 11, is a side view of the head.
Fig. 12, an upper view of the head.
Fig. 13, under surface of the right hand.
Fig. 14, under surface of the right foot.

Genus BUFONELLA, Girard.

Car. gen.—*Tympano distincto. Parotidis glandulis nullis. Lingua elongata, postice latiore, aliquantulum libera et emarginata. Palmarum plantarumque digitis subcylindricis, non palmatis. Cute tuberculosa.*

Gen. Char.—Tympanum distinct. No parotid glands. Tongue elongated, broadest posteriorly, and somewhat free and emarginated. Fingers and toes subcylindrical and free. Skin tuberculous.

Syn.—*Bufonella*, Grd. in Proc. Acad. Nat. Sci. Philad. VI, 1853, 424.

Observ.—This genus is allied to *Bufo*, from which it differs chiefly by the want of parotid glands and the absence of web. From all the other genera of the bufonine group it may be distinguished by the visibility of the tympanum. It is allied to *Engystoma* and *Breviceps*, in having the toes free, but differs from both of them, besides the visible tympanum just alluded to, by an elongated and conspicuous head, separated from the body by a somewhat contracted neck.

Bufonella crucifera, Grd.

Car. spec.—*Colore supra fusco, flavis punctis consperso. Vitta flava dorsuali, in dimidio corporis posteriore. Cruce flavea in summo capite; macula flava in brachio prope axillam. Infra fusco-nigrescente, cum maculis flaveis. Digitorum extremitatibus flavis.*

Spec. Char.—Deep-brown above, dotted with yellow. A dorsal, yellow vitta on the posterior half of the body. A yellow cross on the top of the head; a yellow spot upon the forearm near the axilla. Beneath, blackish-brown, with yellowish maculæ. Tips of fingers and toes yellow.

Syn.—*Bufonella crucifera*, Grd. in Proc. Acad. Nat. Sci. Philad. VI, 1853, 424.

Descr.—The head forms a little less than the third of the entire length, the limbs excluded. Viewed from above, it is regularly ovoid, the snout being rounded and declivous anteriorly and sideways. It is depressed, a little broader than long, and concave upon its upper surface, between and posteriorly to the eyes. In advance of the eyes it is flattened, seems gradually rising to the nostrils, while the declivity of the snout towards the margin of the jaw is quite conspicuous. The nostrils are small and pyriform, situated towards the upper surface, near the declivity of the snout and somewhat nearer the margin of the upper jaw than the anterior rim of the eyes. The latter are of medium size, subelliptical in shape, their diameter being equal to the distance between them and the extremity of the snout. The upper lid is quite developed, externally horny and thin, projecting considerably in the middle. The interocular space is equal to the longitudinal diameter of the eye. The tympanum is proportionally large, assuming an irregular subtriangular shape. It is situated close to the eye and immediately above the angle of the mouth. Though quite distinct it is not conspicuous, owing to the looseness of the skin. The mouth is moderately cleft. The tongue is elongated, club-shaped, broadest posteriorly, slightly emarginated, and free for about one-third of its length. The inner nostrils are small and circular, situated quite anteriorly towards the margin of the roof of the palate. The openings of the Eustachian tubes are smaller than the inner nostrils.

The body is elongated, subcylindrical, a little broader than deep, and preserving well its dimensions posteriorly. The legs are slender and long; the anterior ones, when brought backwards alongside with the body, extend as far as the groins. The fingers are subcylindrical and tapering, with a rounded tip; the first being shorter than the second, which is equal to the fourth. The articulations are provided beneath with rounded tubercles. The palm of the hand is subtuberculous. At the base of the metacarpus may be seen two conspicuous horny disks, the innermost being the largest. The posterior legs are scarcely longer than the body and head together; the inner margin of the tarsus has neither a membranous fold nor any horny ridge. The metatarsal tubercles are quite small, the outer one hardly perceptible. The toes are subcylindrical, tapering, terminated by a rounded knob, and provided with tubercles under their articulations. The sole of the feet is smooth.

The skin is subtuberculous on the back, and glandulous under the thighs and posterior part of the belly.

The ground color is deep-brown above, with a yellow, dorsal vitta on the posterior half of the body only. A yellow bar extends from eye to eye across the upper surface of the head, while another bar, at right angles with the former, runs along the middle of the snout to its extremity. A yellow spot may be observed upon the posterior surface of the anterior portion of the forearm, near the axilla. The inferior surface is blackish-brown with yellowish maculæ. The tips of the fingers and toes are yellow.

Specimens were collected in Australia.

Genus METAEUS, Girard.

Car. gen.—*Tympano celato. Parotidis glandulis nullis. Lingua subelliptica, postice integra, per dimidium longitudinis libera. Palmarum plantarumque digitis subcylindricis, non palmatis. Duobus tuberculis in metatarso. Cute pustulosa.*

Gen. Char.—Tympanum hidden. No parotid glands. Tongue subelliptical, posteriorly entire, and free upon the half of its length.

Fingers and toes subcylindrical, not palmated. Two metatarsal tubercles. Skin pustulous.

Syn.—*Metaeus*, Grd. in Proc. Acad. Nat. Sci. Philad. VI, 1853, 424.

Observ.—The absence of parotid glands is a trait which this genus has in common with *Bufonella*, differing from the latter chiefly by the visibility of the tympanum. The fact of the tongue being entire upon its posterior margin, whilst it is emarginated in *Bufonella*, goes still further towards establishing its claims as a genus.

Metaeus timidus, Grd.

Car. spec.—*Capite magno, antice rotundo. Cute parvis pustulis munita. Colore fusco-viridescente, nigris maculis consperso. Vitta a rostro, trans oculum, ad armum porrecta.*

Spec. Char.—Head large and rounded anteriorly. Skin beset with small pustules; greenish-brown above, maculated with black. A vitta extending from the snout, across the eye, to the shoulder.

Syn.—*Metaeus timidus*, Grd. in Proc. Acad. Nat. Sci. Philad. VI, 1853, 424.

Observ.—This, the only species so far known of its genus, is quite diminutive in size; the greatest length of its body and head together not measuring more than an inch.

Descr.—The head forms the third of that length; it is depressed, almost flat upon its upper surface, and rounded upon the snout. It is a little longer than broad, and, when viewed from above, has an ovoid appearance. The body, itself, is elongated, narrowest posteriorly, the general aspect being more ranine than bufonine. The legs are proportionally small, though quite as much developed as in many ranoids. The entire absence of both palatine and maxillary teeth entitles it to a place amongst bufonoids. The inner nostrils are very large, oblong-shaped, in the longitudinal direction of the head. The openings of the Eustachian tubes are exceedingly minute. The tongue is of medium size, subcircular, or subelliptical, entire posteriorly, and

free upon the half of its length. The eyes are of medium size, elliptical in form, their longitudinal diameter being equal to the distance between their anterior rim and the extremity of the snout. The interocular space is broader than the eyelid. The nostrils are elevated, situated at the upper, terminal end of the snout, though equidistant between the eyes and the margin of the upper jaw. There are no parotid glands. The tympanum is entirely hidden under the skin.

The forelegs are almost exiguous, and, though short, reach the groins when brought backwards alongside with the body. The fingers are subcylindrical; the first one longer than the second, which is nearly equal to the fourth; the third being the longest. The articulations are all provided beneath with conspicuously developed tubercles, and the tip of the fingers slightly swollen beneath, into a tuberculous-like knob. Smaller tubercles may be seen on the palm of the hand, arranged in series in the direction of the fingers, each series composed of at least two tubercles. There is a comparatively large, horny, metacarpal disk, and a horny knob at the base of the first finger. The hind legs are slender but not very long; measured from their origin to the base of the fifth toe, they equal in length the head and body together. The toes exhibit the same structure as the fingers; there are but a few small granules on the sole of the feet, situated towards the base of the toes. The inner metatarsal tubercle is elongated; the outer one is rounded. The inner edge of the tarsus exhibits a very inconspicuous horny ridge.

The skin is smooth, although provided above with small pustules, spread over the head, body, and legs, though fewer on the latter.

The ground color above, is greenish-brown. A deep chestnut-brown vitta starts from the margin of the upper jaw, ascends the snout towards the nostrils, thence along the line of the canthus rostralis to the eye, and passing over the latter, extends obliquely down to near the insertion of the anterior limbs. A transverse brown patch is observed upon the occiput, between the eyes. A larger patch of the same color is seen on the anterior portion of the trunk, and another still smaller, upon its posterior portion. These three patches are united together by means of diverging, narrow branches, giving the back a stellated appearance. Transverse narrow bars of brownish-black are observed upon the legs, more conspicuously on the posterior than on the anterior ones, where two such bars only are seen. The hands and feet above are maculated. Underneath, the color is

dull-yellow, under the head and abdomen, with a few small black spots on the latter region. The legs being reddish, with indistinct yellowish dots.

Found at Valparaiso, Chile.

Genus BRACHYCEPHALUS, Fitz.

Gen. Char.—Head and back protected by osseous shields. Tympanum hidden. No parotid glands. Tongue elongated, entire posteriorly, and free for about half its length. Fourth finger, first and fifth toes rudimentary. No metatarsal tubercles.

Syn.—*Brachycephalus*, Fitz. N. Class. Rept. 1826, 39.—Dum. & Bibr. Erp. gén. VIII, 1841, 726.

Ephippipher, Coct. in *Guér.* Mag. de Zool. 1835, Class. III, Pl. vii & viii.

Observ.—The small batrachian, which is the type of this genus, was first described about thirty years ago, when it was referred to the genus *Bufo*, by Spix. In 1826, Fitzinger proposed for it the genus *Brachycephalus*, since adopted by all herpetologists, although Cocteau, in 1835, expressed the wish that the latter name should be replaced by that of *Ephippipher*, on the ground that its etymology is the same as *Breviceps*, another genus of batrachians. There are many instances of the same kind in the zoological nomenclature. To introduce changes similar to the one just mentioned, would be productive of serious mishaps and drawbacks to real scientific progress.

Cocteau's paper on these batrachians may be considered a good monograph of the genus, and must be consulted by whoever shall undertake writing upon the subject. There is one error in it: the supposition that teeth exist upon the upper jaw and palate. It is now well established that neither maxillary nor palatine teeth are found in the genus *Brachycephalus*, Cocteau having been led into the above error by the desiccated state of the specimens at his command, and which were procured at Rio de Janeiro.

The question now is, whether *B. aurantiacus* is identical with *Bufo ephippium* of Spix. Cocteau is inclined to think that they are different species, upon the ground that the former is of a uniform orange

color, whilst the latter has the upper region of the head and the dorsal shield black. Should, however, no other differences be detected, one might well object to look upon the coloration alone as constituting a valid distinction between two species. The original of *B. ephippium* has never been compared with the specimens described by the French herpetologists who have written upon the subject since Spix. The brevity of the descriptions of both Spix and Wagler do not afford sufficient means of comparison between species.

Such being the state of things, we have preferred to record the specimens collected by the United States Exploring Expedition, under the name of *B. aurantiacus*, the specific name of Cocteau, satisfied that the further investigation of the question will be better subserved in keeping apart what cannot be satisfactorily united.

Brachycephalus aurantiacus, Grd.

(Plate V, figs. 20–24.)

Spec. Char.—Tongue long and narrow. Sides of abdomen and origin of the thighs beneath, glandulous. Color, uniform orange.

Syn.—*Ephippipher aurantiacus*, Coct. in *Guérin*, Mag. de Zool. 1835, Cl. III, Plate vii.

Descr.—The general appearance of this species is that of a diminutive toad. The head is flattened above and below, wedge-shaped, a little broader than long, and forming about the third of the length of the animal. The snout is rounded upon its extremity. The nostrils are proportionally large, oblong, obliquely situated sideways, nearer the extremity of the snout than the anterior rim of the eyes. The latter are proportionally large, subcircular, occupying the whole space between the maxillary and the upper surface of the head. Their diameter is greater than the distance between their anterior rim and the extremity of the snout. The interocular space is greater also than their diameter, hence, proportionally quite large. The tympanum is hidden under the skin. The mouth is of medium size, although its angles do not extend as far back as the posterior rim of the eyes. The upper jaw and palate are toothless. The inner nostrils are circular; situated close to the maxillary and the anterior part of the roof of the mouth. The openings of the Eustachian tubes are quite small. The tongue is elon-

gated and narrow, posteriorly rounded, and free for almost the half of its length. There are no parotid glands.

The body is broader than deep, subovoid in shape, when viewed from above. The limbs are very slender, and the fingers tapering. The anterior legs, when stretched alongside the trunk, do not reach the posterior extremity of the body, although they extend beyond the groins. The fourth finger is indicated exteriorly by a small knob; the first by a minute point. The second is better developed, half the length of the third, which is depressed, and the most conspicuous of all. No membrane uniting the fingers. The palm of the hand is smooth, and upon its base may be seen a rudimentary, metacarpal tubercle. The hind legs are a little longer than the body and head together. The first and fifth toes are rudimentary, like the fourth finger; the second toe is half the length of the third, and the latter is half the length of the fourth, which is conspicuously the longest; the third and fourth are subtuberculous under their articulations. The sole of the feet is smooth; there are no metatarsal tubercles, not even in a rudimentary state.

The upper surface of the head is covered by an osseous shield, leaving the extremity of the snout naked. An osseous, rounded protuberance may be seen at the place occupied by the parotids, when the latter exist, and contiguous to the cephalic shield. Across the anterior part of the back is a large saddle-like shield, of the same osseous nature, in advance of which, on the middle line of the body, is a small subcordiform plate. Sometimes two or three of these small plates are seen in a longitudinal series. There are other instances of fragmentary pieces posteriorly to the saddle-like piece, but evidently detached from the latter, which, itself, is subjected to some variations of outline. The remaining portion of the back not occupied by the shields is covered by a smooth skin, exhibiting occasionally some small tubercles in longitudinal series. The skin over the legs is perfectly smooth. The sides of the abdomen are glandulous, as also the posterior portion of the thighs. The skin on the inferior surface of the head and the belly is glandulous.

The color is of a uniform orange.

Specimens of this species were collected at Rio de Janeiro, Brazil, in December, 1838, when a drawing from life was made by Mr. Joseph Drayton.

Plate V, figs. 20 and 21, represent *Brachycephalus aurantiacus*, from above, and size of life.

Fig. 22, is a view from beneath.

Fig. 23, under surface of the left hand.

Fig. 24, under surface of the right foot.

OPHIDIA.

1855.

Ordo II. OPHIDIA.

The Serpents or ophidian reptiles constitute the most characteristic order of the Class. Their body is elongated, generally rounded, narrow, and, in most cases, diminishing towards both extremities. There are neither limbs nor fins disposed in pairs on the sides of the body, as in most lizards, salamanders, all the toads and frogs, and tortoises. There are, however, a few instances in which rudiments of posterior limbs make their appearance outwardly, under the shape of horny knobs or hooks. The jaws are endowed with the property of being highly dilatable, and thus permit a large prey to enter the buccal cavity. Acerated or hook-like teeth exist upon the jaws generally, and also upon the palatine and pterygoid bones. The eyes are either rudimentary or else well developed; in no case is there a movable eyelid. The organ of audition is not made apparent outwardly; there being neither an aperture nor a tympanic membrane. Their skin is rather tough, capable of great extension, beset with scales or granules, and covered by a continuous epidermis, which is cast and reproduced several times during the year.

Such are the most striking characters of the order of reptiles we are now treating of. More detailed information may be found in the "Erpétologie générale."

The want of a more complete series of ophidians, either in this or other collections available for our investigations, has rendered the arrangement of the following ones into families, one of the most difficult point. The classification recently proposed by Duméril, we could not adopt *a priori*, and lacking the proper materials to satisfy ourselves as to the value of the families by him established, we renounced altogether heading these groups, placing the genera one after the other, according to their apparent zoological affinities.

Genus SABRINA, Girard.

Car. gen.—*Capite depresso, subovato. Scuto rostrali sub rostro recurvato. Nare inter scutum nasalem et frontonasalem sita. Scuti alii sunt: praeocularis seu postnasalis, frontalis, postoculo-labialis, parietalis, et postparietalis.*

Gen. Char.—Head depressed, subovoid. Rostral plate extending under the snout; one nasal and one fronto-nasal: nostril between them. A preocular or postnasal plate. A frontal. A postoculo-labial. A parietal, and a postparietal.

Syn.—*Sabrina*, Grd. in Proc. Acad. Nat. Sci. Philad. August, 1857.

Observ.—This is one of the so-called worm snakes, Scolecophides, or vermiform ophidians, and the only one in the collection of the United States Exploring Expedition. It is the same as was observed by Tschudi, a brief account of which is given in the "Fauna Peruana" of the same author.

The Scolecophides have been divided into two families by Duméril and Bibron, the Typhlopians and the Catodonians. Tschudi referred his species to the former, and, according to our own observations, it is to enter the latter, since we found the teeth upon the lower jaw instead of the upper.

At the same time, we had to frame a new genus, distinct at the same time from *Catodon* and *Stenostoma*, the only two, so far known, of that group.

Sabrina tessellata, Grd.

(Plate XV, fig. 7–9.)

Spec. Char.—Middle of scales blackish-brown, with a lighter margin increasing in width beneath. Tip of tail whitish.

Syn.—*Typhlops tessellatum*, Tsch. Faun. Peruan. Herp. 1845, 46.
Sabrina tessellata, Grd. in Proc. Acad. Nat. Sci. Philad. August, 1857.

DESCR.—The head is continuous with the body, very slightly swollen upon its middle, the snout being prominently rounded and protruding beyond the lower jaw. Its upper surface is depressed. The rostral plate is the largest of the cephalic series, occupying the convexity of the snout, and rather more expanded beneath than above, though wider upon its middle. On each side of the rostral, and extending likewise from the margin of the upper jaw to the upper surface of the head, is to be observed a nasal plate, broadest upon its middle, where a small nostril is situated, just upon the convexity of the snout. The ocular plate starts from the very margin of the upper jaw, spreading as it ascends, and, towards its anterior upper edge, may be seen the eye, of rather large proportion. A narrow preocular extends from the margin of the jaw, between the nasal and the ocular, meeting upwards with a similarly elongated, but little larger, suroculary or oculo-frontal, as there is no other plate of that name. A large postoculo-labial plate occupies the region extending from the ocular plate to the angle of the mouth, where it is met by the scales of the neck. Immediately above the postoculo-labial may be observed a parietal and a postparietal, both very similar in size and shape. The vertex region of the head is occupied by three subhexagonal scales, being a direct continuation of the dorsal series.

The mouth, seen from beneath, constitutes a semi-elliptical curve. The inferior labials are very similar to the adjoining submaxillary scales, which, in their turn, are but a trifle smaller than the abdominal ones. The teeth are exceedingly small and exiguous.

The body, about four inches in total length, is subcylindrical in shape, almost of the same thickness from head to tail, which is slightly tapering and conical at the apex. Fifteen longitudinal rows of scales may be counted as surrounding the body. The scales themselves are proportionally well developed, imbricated, subhexagonal in general appearance, and a little smaller under the belly than over the back. The tail, about twice the length of the head, is surrounded by scales of the same appearance and structure as those of the body. There is a large, semicircular, preanal scutella.

The centre of each scale being either chestnut or blackish-brown, while their margin is of a light-yellow or straw color, the body assumes the appearance of being streaked with dark and light stripes, particularly when the dark spots unite anteriorly and posteriorly with their fellow, which is sometimes the case along the upper region of

the body. On the head and beneath, the general hue is lighter, owing to a greater development of the light margin of the scales and the isolation of their central dark spot.

Loc.—This species inhabits the coast of Peru; the specimen described was collected in the rafters of houses at Callao.

Plate XV, fig. 7, represents the head of *Sabrina tessellata*, viewed in profile.

Fig. 8, is an upper view of the same; and

Fig. 9, an under view, exhibiting the outline and shape of the mouth.

All these figures are magnified about four times, in order to show more distinctly the various plates.

Genus CYLINDROPHIS, Wagl.

Gen. Char.—In this genus there are teeth in the upper and lower jaws, on the palatine and pterygoid bones; none on the premaxillaries. The pupil is circular; the nostril situated within one plate. The internasal plates are absent; the cephalic ones, seven in number. Neither a loral nor any anteorbitals; one postorbital only. The scales are smooth, surrounding the entire body, so that there are no abdominal scutellæ, transversely elongated, contrasting with the dorsal scales. The subcaudal scutellæ are entire, and very similar to the ordinary scales of the upper region.

Syn.—*Cylindrophis*, Wagl. Natur. Syst. Amph. 1830, 195.—Dum. & Bibr. Erp. gén. VI, 1844, 590.

Observ.—In drawing up the characters of the genus *Cylindrophis*, we have had for our sole guidance the species recorded below, and therefore may have to be remodelled so as to include other species. Then, again, the question will recur as to the validity of the genus *Ilysia*, of Hemprich, a question to be settled by the comparative study of all the species referred to both of these genera.

Cylindrophis rufa, Gray.

Spec. Char.—Tail conical, shorter than the head. Body above black, brown, or rufous, either uniform or provided with obsolete, transverse, white bars; a white collar about the neck; head and extremity of tail black; a white spot on the frontal plates. Beneath white and black in alternate bands.

Syn.—*Anguis rufa*, Laur. Synops. Rept. 1768, 71.—Shaw, Gen. Zool. III, ii, 1802, 586.

Anguis rufus, Gmel. *Linn.* Syst. Nat. III, 1788, 1123.—Schn. Hist. Amph. II, 1801, 333.

Anguis striatus, Gmel. *Linn.* Syst. Nat. III, 1788, 1119.

Anguis scytale, Russ. Ind. Serp. Suppl. 1801, 30, Pl. xxvii.

Anguis corallina, Shaw, Gen. Zool. III, ii, 1802, 582, Pl. cxxxi.

Eryx rufa, Daud. Hist. Nat. Rept. VII, 1803, 263.

Tortrix rufa, Merr. Tent. Syst. Amph. 1820, 84.—Gray, Syn. Rept. in *Griff.* Anim. Kingd. IX, 1831, 74.—Schinz, Naturg. Abbild. Rept. 1834, 131, Pl. xlviii, fig. 2.—Schleg. Ess. physiogn. Serp. I, 1837, 128, & II, 9, Pl. i, fig. 1–3.—Filip. Catal. ragion. Serp. Mus. Pav. 1840, 13.

Scytale scheuchzeri, Merr. Tent. Syst. Amph. 1820, 91.

Ilysia rufa, Lichtenst. Verz. Doubl. Zool. Mus. Berl. 1823, 104.—Fitz. N. Class. Rept. 1826, 54.

Cylindrophis rufa, Gray, Zool. Miscell. 1842, 46.—Dum. & Bibr. Erp. gén. VI, 1844, 595, & VII, i, 1854, 30.

Cylindrophis rufus, Cantor, Journ. Asiat. Soc. XVI, 1847, 53.

Descr.—The head is subconical, of moderate development. The snout is rounded. The eyes quite small and circular. The occipital plates are but a little larger than the scales immediately behind them. The vertex plate is conspicuous, subtriangular, with its summit directed backwards, whilst its base is somewhat convex. There is but one pair of frontal plates properly so called; they are the largest on the upper surface of the head. In advance of the latter, we observe a pair of fronto-nasals, towards the inferior part of which the nostril opens. The rostral is small and pyramidal, and entirely enclosed by the fronto-nasals. The first labial is the smallest of the series; it is subquadrangular, transversely elongated, occupying the space opposite the fronto-nasal plate. The second and third labials are superiorly contiguous with the frontal; the third is the largest, and, together

with the fourth, constitute the lower portion of the orbit; the anterior portion being formed by the frontal. A subquadrangular postorbital is situated between the fourth labial and the supraoculary plate, which is subtriangular, and a little smaller than the vertex plate. The fifth and sixth labials, smaller than the third and fourth, assume the shape of the temporal shields, which are larger than the occipitals, and, consequently, larger than the scales about the neck. There are, likewise, six lower labials; the third, fourth, and fifth being the largest, whilst the sixth is the smallest. The symphyseal is quite small and entirely enclosed by the first pair of labials. The subgular scales are longer than broad, in which respect they differ from those of the abdomen, which are broader than long.

The neck is so slightly contracted that the head is almost continuous with the body, which is thicker on its posterior than on its anterior portion. The scales are smooth and shining, a little smaller on the dorsal than on the abdominal region. They are subrhomboidal in shape, longer than broad on the back, broader than long on the abdomen, and both dimensions nearly equal on the sides. There are no abdominal scutellae, though the middle series of scales is slightly larger than the adjacent series, but not different in shape. We count twenty longitudinal series of scales across the middle region of the body, and upwards of two hundred transversal ones from the nape to the origin of the tail. The tail is very short and conical, exhibiting six small subcaudal scutellae. The total length of the specimen described is seventeen inches.

Its color is lustrous-black above, with very faint traces of transverse light bars covering thirteen dorsal series of scales, thus embracing the back and the upper half of the sides, the lower half of which and the abdomen, being white and black, in alternate transverse bands, sometimes interrupted upon the middle of the abdomen, the black being a little broader than the white, and not in contiguity with the black of the upper region. The head and the tip of the tail are black. There is a white narrow ring continuous under the neck, and interrupted above. A whitish spot is also to be observed upon the frontal plates.

Loc.—The specimen described was obtained at Singapore.

Genus WENONA, B. & G.

Char. gen.—*Rostro ultra inferiorem maxillam producto. Oculis parvulissimis. Scuto verticis amplo et breve. Scutis frontalibus in dua aut tria paria dispositis; occipitalibus parvis. Scuti alii sunt: praefronto-nasalis et postnasalis, inter quos est naris in sutura sita; loreus sive cum postfrontalis coalescente sive distincto; anteorbitalis unus; postorbitales duo aut plures; temporales numerosi. Squamis laevibus, in quadraginta quinque series longitudinales dispositis. Scutella postabdominali, seu praeanali, indivisa; subcaudalibus similiter indivisis. Cauda breve cum apice obtuso. Colore uniforme.*

Gen. Char.—Snout protruding beyond the lower jaw. Eyes very small. Vertex plate broad and short. Two or three pairs of frontals. Occipitals small. A prefronto-nasal and a postnasal; the nostril placed between them. Loral united to the postfrontal or else separated. One anteorbital; two or more postorbitals. Temporal shields numerous. Scales smooth, disposed upon forty-five longitudinal series. Postabdominal scutella entire. Subcaudal scutellae entire also. Tail short, bluntly terminated. Unicolor.

Syn.—*Wenona*, B. & G. Proc. Acad. Nat. Sci. Philad. VI, 1852, 176; & Catal. N. Amer. Rept. I, 1853, 139.

Observ.—There are, so far, but two known genera of the group of Boidae within the limits of the United States and Territories, *Wenona* and *Charina*, both of which being provided with vestiges of posterior limbs and a tail that is not prehensile. We regret not having at our command specimens of *Charina bottae*, in order to institute between it and the species of *Wenona* a critical comparison, since the two genera appear to us most intimately related. In *Charina*, the subcaudal scutellae appear to be a good deal smaller than in *Wenona*, as exhibited by the figure of *Tortrix bottae*, Blainv. (the type of Gray's genus *Charina*), published in the "Nouvelles Annales du Muséum d'histoire naturelle," for 1835. There are several other prominent differences between these two genera, according to Gray's description in the "Catalogue of the Specimens of Snakes in the collection of the British Museum," published in 1849, and to which we are compelled to refer our readers.

1. Wenona plumbea, B. & G.

(Plate VII, figs. 1–7.)

Char. spec.—*Scutis frontalibus in tria paria dispositis; pare medio cum loreo coalescente, proinde ad labiales extendente. Scutis labialibus in orbitum non productis. Colore plumbeo-coeruleo supra; infra vero albo-flavescente.*

Spec. Char.—Three pairs of frontal plates; middle pair united to the loral, and, consequently, extending to the labials. Labials not entering into the rim of the orbit. Uniform bluish-lead color above; uniform yellowish-white beneath.

Syn.—*Wenona plumbea*, B. & G. Proc. Acad. Nat. Sci. Philad. VI, 1852, 176; & Catal. N. Amer. Rept. I, 1835, 139.

Descr.—The upper surface of the head is slightly convex; the snout being rounded and prominent. The vertex plate is as broad as long, obtuse-angled anteriorly, and rounded posteriorly. The postfrontals are small and triangular; the middle frontals, subangular in shape, are transversely elongated, reaching the labials at the commissure of the second and third, thus occupying the place of the loral. The prefrontals are angular posteriorly, rounded anteriorly, reaching the first labial, and occupying the place of the prenasal. The rostral is broad and large. The postnasal is subtriangular, elongated, with its apex directed backwards. The nostrils are vertically elongated, situated between the lateral expansion of the prefrontal and the postnasal. The occipitals are quite small and united in one plate, mayhap exceptionally. The anteorbital is large, subpyramidal, its apex reaching the upper surface of the head, where it meets the vertex one, being produced between the supraoculars and the postfrontals. The supraoculars themselves are subquadrangular, more developed upon the surface of the head than in the rim of the orbit. There are four postorbitals; the uppermost being the largest, and by its elevated position might be considered as a second supraocular, whilst the inferior one, which is the next in size, rests upon the fifth labial, and might be taken for a second suborbital. The suborbital proper is large and polygonal, situated upon the commissure between the fourth and fifth

labials. The temporal shields are numerous, small, scale-like. The cleft of the mouth is slightly deflected. The upper labials are nine in number; the anterior three are larger than the rest; the fifth is broadest; none reach the orbit. The lower labials are small; the anterior three being the largest; the first pair on each side of the symphyseal meet posteriorly, enclosing the latter. Three pairs of mental shields may be seen along the middle region, immediately behind the junction of the first pair of labials.

The body is subcylindrical, deeper than broad; the abdomen being comparatively narrow. The tail is short, thick, blunt upon its extremity. The scales are small, irregular, subelliptical or sub-lozengiform, disposed upon forty-five longitudinal series, proportionally large in the outer series, and deeper than long. In the second series the scales are larger still than in the remaining ones, where they become uniformly small, scarcely diminishing towards the middle region of the back; on the tail, however, they are somewhat larger. The abdominal scutellae are two hundred and six, and the subcaudal ones, twenty-seven in number.

The ground color is of a uniform bluish-lead hue above, and yellowish-white beneath.

Loc.—A specimen, a little short of eighteen inches, was collected up Puget Sound, Washington Territory.

Plate VII, fig. 1, represents *Wenona plumbea*, size of life.
Fig. 2, is a side view of the head.
Fig. 3, an upper view of the same.
Fig. 4, the head, seen from below.
Fig. 5, a front view of the same.
Fig. 6, the disposition of the scales.
Fig. 7, the vent, with the preanal scutella, and the minute scales surrounding it.

2. Wenona isabella, B. & G.

(Plate VII, figs. 8–14.)

Char. spec.—*Scutis frontalibus in dua paria dispositis. Scuto loreo angulare. Quarto et quinto labialibus in orbitum productis. Scuto*

verticis anteriore parvo, inter postfrontales sito. Colore sordide flavo supra, infra vero obsoleto-flavo.

Spec. Char.—Two pairs of frontal plates. An angular loral. Fourth and fifth upper labials entering into the rim of the orbit. A small anterior vertex plate situated between the postfrontals. Uniform isabel-color above, dull-yellow beneath.

Syn.—*Wenona isabella*, B. & G. in Proc. Acad. Nat. Sci. Philad. VI, 1852, 176; & Catal. N. Amer. Rept. I, 1853, 140.

Descr.—The eye is larger than in the preceding species, and the snout less protruding. The upper surface of the head is flat; the snout rounded upon its periphery. The normal vertex plate is broader than long and rounded posteriorly. A small plate is situated immediately in advance of the latter and between the postfrontals, which may be considered as a second vertex plate. A small, transversely elongated occipital is observed. There are but two pairs of frontals; the postfrontals are largest, subangular, united on the right side with the loral, whilst on the left side the loral is distinct from the postfrontal, and angular in shape. The prefrontals are likewise subangular, extending to the first upper labial, and occupying the place of the prenasal. The rostral is broad, obtuse-angled above. The anteorbital is large, sub-lozengiform, extending to the upper surface of the head, being produced between the postfrontal and supraocular, and contiguous to the vertex plate. The supraocular is proportionally larger than in *W. plumbea*, and irregularly rounded. We observe three subangular, polygonal postorbitals; the middle one being the smallest and elongated. Numerous temporal shields, of the size of the postorbitals, and slightly smaller than the scales. The cleft of the mouth is nearly horizontal. The upper labials are nine in number; the anterior five higher, else deeper than the rest; the fourth and fifth entering into the orbit, and thus replacing the suborbitals which are wanting. There are ten lower labials; the anterior four larger than the rest. The first pair encloses the symphyseal, and posteriorly along the middle region, may be seen four pairs of mental shields.

The body is subcylindrical, deeper than broad; the abdomen being narrow. The tail is short and thick, blunt posteriorly. The scales resemble those of *W. plumbea*, but are proportionally larger. Those constituting the outer row, not quite so deep compared to their length.

The abdominal scutellae are two hundred and ten in number, the subcaudal ones are thirty-four.

The color is of a uniform isabel hue above; dull-yellow beneath.

Loc.—A specimen, a little over fifteen inches, was collected up Puget Sound, Washington Territory.

Plate VII, fig. 8, represents *Wenona isabella*, size of life.
Fig. 9, is a side view of the head.
Fig. 10, a view of the same, from above.
Fig. 11, exhibits the inferior surface of the head.
Fig. 12, a front view of the same.
Fig. 13, the disposition of the dorsal scales.
Fig. 14, the vent and adjoining scutellae.

Genus MORELIA, Gray.

Gen. Char.—Upper surface of head covered with scale-like plates. Three pairs of frontal plates larger than the rest. Vertex plate small. A pit on each side of the rostral plate. Anterior three upper labials pitted; hindermost six lower labials pitted also. Nostrils lateral, in a single plate, with a groove beneath. Eyes lateral, of medium size; pupil elliptical, vertical. Dorsal scales smooth. Subcaudal scutellae disposed upon a double row.

Syn.—*Morelia*, Gray, Zool. Misc. 1842, 43; & Catal. Snakes, Brit. Mus. 1849, 82 & 85.

Observ.—This genus belongs to the group of Pythonians, whose chief features consist in the development of the premaxillary teeth and supraoculary bone, and in the arrangement of the subcaudal scutellae upon a double row. All the Pythonians inhabit the Old World.

Morelia argus, Dum. & Bibr.

Spec. Char.—Dorsal scales small, lanceolated, subtruncated towards the sides and also posteriorly, disposed upon forty-seven longitu-

dinal series. Tail small, subconical, and tapering to a point. Above bluish-black, irregularly spotted with yellow; beneath yellowish, maculated with bluish-black.

Syn.—*Serpens arabica, &c.* Seba, Thes. Nat. II, 1734, 108. Tab. 103, fig. 1.

Vipera argus, Klein, Tent. 1755, 21.

Coluber argus, Linn. Syst. Nat. I, 1758, 389.—Daud. Hist. nat. Rept. VI, 1803, 312.

Coluber spilotes, Lacep. Ann. Mus. hist. nat. IV, 1802, 194.

Natrix argus, Merr. Tent. Syst. Amph. 1820, 90 & 126.

Echidna spilotes, Merr. Tent. Syst. Amph. 1820, 150.

Python punctatus, Merr. Tent. Syst. Amph. 1820, 90.—Fitz. Neue Class. Rept. 1826, 54.—Boie, Isis. XX, 1826, 516.

Leptophis punctulatus, Gray, in *King's* Voy. Austr. II, 1827, 432.

Leptophis spilotus, Gray, in *King's* Voy. Austr. II, 1827, 433.

Python peronii, Cuv. Mus. Paris, 1827.—Less. Ann. Sci. nat. XIII, 1828, 391.—Wagl. Descr. & Icon. Amph. 1833, Taf. I.—Schleg. Ess. physiogn. Serp. 1837, 421. Pl. xv, figs. 11 & 12.—Fitz. Syst. Rept. 1843, 24.

Morelia punctata, Gray, Zool. Misc. 1842, 43.

Morelia argus, Dum. & Bibr. Erpét. gén. VI, 1844, 385.

Morelia spilotes, Gray, Catal. Snakes, Brit. Mus. 1849, 85.

Australasian snake, Shaw, in *White's* Voy. N. S. Wales, 1790, 259; and, Gen. Zool. III, ii, 1802, 505. Vignette on title page.

Observ.—There are two prepared skins of this species in the collection we investigate; the largest one measures about six feet in total length. The dorsal scales increase in size from the middle region of the back sideways; the series adjoining the abdominal scutellae being very large. They are, likewise, larger towards the posterior portion of the back and on the tail than anteriorly. As they increase in size they become less lanceolated, assuming more a truncated or rounded outline.

The upper regions are of a bluish-black hue, more or less intense; each scale bearing an elongated yellow spot upon its centre. Irregular series of yellow blotches are formed by groups of four to six scales entirely yellow. An angular yellow band may be observed on each side of the occiput. The inferior regions are yellow, anteriorly spotted, posteriorly maculated with bluish-black. A lateral series of orange blotches may be observed along the middle region of the body.

Loc.—"Found in Mr. Couthouy's bed, on the ground floor of a house near Sydney," Australia.

Genus ENYGRUS, Wagl.

Gen. Char.—The body, in this genus, is deeper than broad, and the tail, of moderate development, is prehensile. Vestiges of posterior limbs may likewise be observed on each side of the anal opening, and much more developed than in *Wenona*. The upper surface of the head is covered with small polygonal scales instead of plates. The eyes are lateral, that is, placed altogether upon the sides of the head; the pupil is vertically elliptical. We observe no pits upon the lips. The scales are carinated, rather small, and disposed upon numerous longitudinal series, from thirty-two to thirty-eight in number. The preanal scutella is entire, and the subcaudal scutellae also, that is, disposed upon a single series.

Syn.—*Enygrus*, Wagl. Nat. Syst. Amph. 1830, 167.—Dum. & Bibr. Erp. gén. VI, 1844, 476.

Observ.—The genus *Tropidoboa* we have never seen characterized, and therefore are not prepared to discuss its merits as compared to *Enygrus*. We see it mentioned on Plate I of the "Voyage au Pole Sud et dans l'Océanie," but Duméril has not deemed it advisable to retain it.

Enygrus bibroni, Dum. & Bibr.

(Plate VIII, figs. 8–11.)

Spec. Char.—Cephalic scales considerably larger anteriorly than posteriorly. Dorsal scales disposed upon thirty-eight longitudinal series. Abdominal scutellae two hundred and forty-four; subcaudal scutellae sixty-two. Color above brownish or blackish, with irregular, large, black blotches; beneath yellowish-white, with longitudinal bands of black.

Syn.—*Enygrus bibroni*, Dum. & Bibr. Erpét. gén. VI, 1844, 483.

Tropidoboa bibroni, Hombr. & Jacq. in *Dumont D'Urv.* Voy. au Pole Sud et dans l'Océanie. Zool. Rept. 1842, Pl. I.

Descr.—The head is elongated, very much depressed, nearly plane on the occipital, interoculary, and frontal regions, whilst it is declivous towards the loral region. The extremity of the snout is truncated from outwards inwards, so that the upper jaw is seen projecting beyond the lower. The mouth is deeply cleft. The eyes, subcircular in shape, are well developed, situated on the sides of the head, with the longitudinal diameter a little longer than the vertical, whilst the pupil is vertically elliptical. The cephalic, scale-like plates, are carinated, and provided moreover with a few very minute tubercles. The rostral plate is broader than high, does not extend to the upper surface of the snout, is rounded upon its upper margin, which is wider than its lower margin. The nostrils are situated sideways, in the middle of a single plate. The plates upon the fronto-nasal region are considerably larger than on the occipital region, where they are quite small. The orbit is formed by a complete circle of subquadrangular plates, nearly equal in size, except one anteorbital, which is larger than the others. Three or four subquadrangular plates, disposed upon one series between the anteorbital and the nasal, are generally well developed and diminishing in size forwardly; or else the phrenic region is covered with plates similar in size and shape to those of the upper surface of the head, and disposed upon two series. A third series is composed of two or three small plates, situated above the fourth and fifth labials. The upper labials are ten or eleven in number; the fifth and sixth being situated under the eye, but are excluded from the orbit; the second, third, fifth, and sixth are the largest; the first, fourth, and seventh are next in size, the remaining ones becoming gradually smaller towards the angle of the mouth. The symphyseal is very much developed, larger than any of the lower labials, broadest towards the tip of the jaw, tapering and rounded posteriorly, and slightly concave laterally. There are about twelve lower labials, the anterior one entirely separated from its fellow by the symphyseal. The anterior six are elongated vertically; the remaining ones quadrangular, diminishing in size posteriorly. We observe four pair of small, scale-like, mental shields, divided by a longitudinal groove. The scales under the throat are slender and elongated.

The body is much deeper than broad, and convex above, whilst it is flattened along the abdomen. The dorsal scales, disposed upon thirty-two or thirty-eight longitudinal series, are all carinated, except the series adjoining the abdominal scutellae, where the scales are broad

and very obtuse upon their posterior margin. The next seven series are composed of quite small and narrow scales, whilst upon the middle region of the back they are the largest of all, broad upon their base. The abdominal scutellae are from two hundred and eighteen to two hundred and forty-four in number and of moderate development; the preanal one being entire, as well as the rest. The tail, which forms about the seventh of the total length, is subconical; thirteen longitudinal series of scales may be counted upon its base. The subcaudal scutellae, fifty-five to sixty-two in number, are all entire.

The ground color above is either brown, fawn, greyish, or blackish, over which large black patches are more or less apparent. These patches are angular, irregular, and incompletely defined, with intervening spaces on the back of reddish-brown; they constitute a dorsal series, and, occasionally, one or two lateral series. The upper surface of the head is barred with black. Beneath, the color is yellowish-white, with a series of black, confluent spots along the external edge of the scutellae, so as to appear like a continuous black band. The middle of the abdomen may exhibit a similar blackish band, which becomes sometimes irregular, giving to the whole abdominal region a marbled appearance.

Loc.—Specimens of this species were collected at Savai and Upolu (Navigator Islands), as also on the Feejees, where they appear to be more common than in the former group of islands. According to the naturalists of the Exploring Expedition, these snakes are sluggish and inoffensive, and were often brought to them by the natives.

Genus RABDION, Dum.

Gen. Char.—The body is slender and cylindrical, covered with smooth scales. The tail short and tapering, and the abdominal scutellae large. The snout is rounded. The cephalic plates are normal; we observe one nasal, no loral, one anteorbital, one or two postorbitals, six upper labials, the third and fourth beneath the eye, and entering into the orbit. Postabdominal scutella divided; subcaudal scutella disposed upon a double series.

Syn.—*Rabdion*, Dum. & Bibr. Erp. gén. VII, I, 1854, 115.

OBSERV.—We take this genus as established in the "Erpétologie générale," modifying simply that part of its diagnosis relating to the postocular plates: the species described below having two such plates instead of one. In every other respect, the latter has all the generical characters assigned to *Rabdion.*

This genus and the two following ones belong to the family of *Calamaridae;* the representatives of which are, generally speaking, of a diminutive size. Their head and body are slender; the latter subcylindrical and nearly of uniform diameter from head to tail. The tail itself is always short, oftentimes tapering. Their habits are terrestrial, keeping in dark places, either sheltered under stones or concealed in the brush or decayed wood; on that account they are seldom brought to the notice of travellers, unless sought after within their retreats.

RABDION OCCIPITALE, Grd.

CHAR. SPEC.—*Capite valde depresso; oculis magnis. Squamis dorsualibus in quindecim series longitudinales dispositis. Supra subflavo, squamis fusco marginatis; infra unicolore. Capite et collo nigris, cum macula occipitali flava.*

SPEC. CHAR.—Head very much depressed. Eyes large. Dorsal scales disposed upon fifteen longitudinal series. Ground color yellowish; scales margined with brown; beneath unicolor. Head and neck black, with an occipital yellow spot.

SYN.—*Rabdion occipitale,* GRD. in Proc. Acad. Nat. Sci. Philad. August, 1857.

DESCR.—A single specimen of this species is before us; it measures seven inches and a half in total length. The head is very small, and less than three-eighths of an inch long; it is very much depressed, subovoid when seen from above, broadest upon the temporal region. The snout is rounded, and both jaws are equal. The vertex plate is pentagonal, subcordiform, nearly as broad as long. The occipital plates are the largest of the cephalic series; they are elongated, narrowest posteriorly, and slightly undulating upon their external edge. The postfrontals are much larger than the prefrontals, sub-

quadrangular in shape when viewed from above; they extend to the sides of the head, occupying the place of the loral plate: the latter being absent. The prefrontals are small and subtrapezoid. The rostral is broad, but low and scarcely visible upon an upper view of the head. There is but one subtriangular nasal plate, in the middle of which may be seen a quite large nostril, situated altogether on the sides of the snout. We notice a single anteorbital, of moderate development, extending somewhat to the upper surface of the head. The supraocular is twice as long as broad. There are two postorbitals; the uppermost being more quadrangular than the lower, and both a little smaller than the anteorbital. The eyes are proportionally large, and the pupil is circular. The temporal shields are larger than the scales of the body. There are six upper labial plates; the anterior one is very small, situated under the nasal; the others are well developed: the second is contiguous to the lateral expansion of the postfrontals upon the loral region; the third and fourth enter into the orbit, the anteorbital resting upon the third, and the inferior postorbital upon the fourth, the commissure of these plates being situated in advance of the pupil; the fifth and sixth labials are subtriangular, contiguous only upon one of their angles, since the largest of the temporal shields thrusts itself between them. The symphyseal plate is well developed and triangular. We observe seven inferior labials (on each side), the fourth being a great deal larger than the rest. There are two pairs of well-marked mental shields. The region of the throat is occupied by subangular scales, a little larger than those of the body.

The body and neck are subcylindrical, rather flattened beneath; the neck is more slender than the body, properly so called. The scales are disposed upon fifteen longitudinal series, smallest along the dorsal line, and increasing in size towards the abdomen. The abdominal scutellae are very narrow, but transversely quite long; they number about one hundred and eighty, the preanal one being much broader than the others, convex exteriorly, and subdivided. The tail, a little more than an inch in length, is conical and tapering. The subcaudal scutellae are in pairs, thirty-seven in number. The apex of the tail terminates in a horny process.

The upper surface of the head and anterior portion of the neck is jet black, with an insulated, yellow, occipital spot, transversely elongated, convex posteriorly, subconcave anteriorly, and truncated laterally. The margin of the upper jaw is straw-colored, as is also the

lower jaw, the throat, the abdominal and subcaudal regions. The upper region of the body and tail is likewise yellowish, but, since each scale is provided with a chestnut-brown margin, the entire surface assumes a reticulated appearance. The scales of the middle dorsal row having that chestnut-brown margin more strongly marked than the rest, the body appears as if provided with a dorsal brown band.

Loc.—This species was found under the bark of a tree, at Upper Hunter, near Sydney, Australia.

Genus LODIA, B. & G.

Char. gen.—*Capite ovato, discreto. Oculis magnis, circularibus. Scutis verticis duobus; nasalibus duobus; loreo in orbitum producto; anteorbitali uno; postorbitalibus duobus; supra-labialibus elongatis, magnis. Scutellis mentalibus in unum par dispositis. Squamis laevibus. Scutella postabdominali, seu praeanali, divisa; subcaudalibus in duplicem seriem dispositis.*

Gen. Char.—Head ovoid, distinct from the body. Eyes large and circular. Two vertex plates. Two nasals. Loral entering into the orbit with an anteorbital. Postorbitals two. Supraocular elongated and large. Mental shields one pair. Scales smooth. Postabdominal scutella divided. Subcaudal scutellae disposed upon a double series.

Syn.—*Lodia*, B. & G. Catal. N. Amer. Rept. I, 1853, 116.

Observ.—By its general appearance this genus reminds us of *Calamaria* proper. It is composed, so far, of but one species, inhabiting the northwestern coast of America.

Lodia tenuis, B. & G.

(Plate IX, figs. 8–11.)

Char. spec.—*Squamis dorsualibus in quindecim series longitudinales dispositis. Corpore supra fusco, a latere coeruleo; vitta pallida in*

utroque latere. Abdomine clariore, scutellis coeruleis a base. Cauda infra unicolore, a latere coerulearum macularum serie instructa.

Spec. Char.—Dorsal scales disposed upon fifteen longitudinal series. Body dull-brown above, bluish on the sides, with a longitudinal lighter stripe on each flank. Abdomen lighter; base of scutellae bluish. Tail beneath unicolor, with a lateral series of bluish spots.

Syn.—*Calamaria tenuis*, B. & G. in Proc. Acad. Nat. Sci. Philad. VI, 1852, 176.
Lodia tenuis, B. & G. Catal. N. Amer. Rept. I, 1853, 116.

Descr.—The ordinary vertex plate is hexagonal, broad anteriorly, and acute-angled posteriorly. The anterior vertex plate is much smaller than the former, ovoid or subelliptical, and situated between the postfrontals, which are angular and extend to the sides of the head. The prefrontals are subtriangular, about half the size of the postfrontals just alluded to. The rostral is broad and well developed, whilst the supraoculariesare rather small. The occipitals are externally subangular, large, and elongated. The nasals are well developed, the prenasal being the largest; the nostril situated in the middle, between the two plates. The loral is large, polygonal, elongated, situated above the commissure of the second and third upper labials, and entering into the orbit as an inferior anteorbital. A quadrangular upper anteorbital is inclosed between the postfrontals, supraocular, and loral. There are two angular postorbitals, the lower one resting upon the commissure of the fourth and fifth labials. The temporal shields are conspicuous, the anterior one largest and elongated. The mouth is deeply cleft; the upper labials are six in number, the three posterior ones being a little larger than the three anterior. The lower labials are six also; the fourth is the largest. The mental shields, of which there is but one pair, are large and elongated.

The body is slender, subcylindrical. The tail short, conical, and tapering, constituting about the seventh of the entire length. The scales are proportionally large, rhomboidal, smooth, forming fifteen longitudinal series, the outer one of which being but slightly broader than the rest.

There are one hundred and fifty-one abdominal scutellae; the preanal one subdivided. The subcaudal scutellae are thirty-three in number, and arranged upon a double series.

The color above is dull-brown, and bluish on the sides, with a longitudinal light stripe upon each. The abdomen is lighter than the back, with the base of the scutellae bluish. The tail beneath is unicolor, with an external series of bluish spots.

Loc.—A specimen, a little over eight inches, was collected on Puget Sound, Washington Territory.

Plate IX, fig. 8, represents *Lodia tenuis*, size of life.
Fig. 9, is the head, in a profile view.
Fig. 10, an upper view of the head.
Fig. 11, the head, from below.
Figs. 9–11 are double the size of life, for the purpose of showing more accurately the various plates.

Genus CONTIA, B. & G.

Char. gen.—*Corpore brevissimo. Capite ovato. Oculis parvis. Rostro truncato. Scutis cephalicis normalibus. Scuti alii sunt: nasalis, loreus praeorbitalis, et postorbitalis. Squamis laevibus. Scutella praeanali, seu postabdominali, divisa; subcaudalibus in duplicem seriem dispositis.*

Gen. Char.—Body rather short. Head ovoid. Eyes small. Snout truncated. Cephalic plates normal. One nasal; nostril in the middle. One loral. One anteorbital and one postorbital. Scales smooth. Postabdominal scutella divided. Subcaudal scutellae disposed upon a double series.

Syn.—*Contia*, B. & G. Catal. N. Amer. Rept. I, 1853, 110.

Observ.—This is another representative of the family of *Calamaridae*, in Western North America. The only species of the genus known to the present day, is described further on.

Contia mitis, B. & G.

(Plate X, figs. 6–12.)

Char. spec.—*Squamis dorsualibus in quindecim series longitudinales dispositis. Colore supra spadiceo; vitta pallida in utroque dorsi latere et subter eam nigrorum punctorum serie. Squamae minimis nigris punctis notantur. Scutellis singulis antice nigris, postice vero pallide fulvis.*

Spec. Char.—Scales disposed upon fifteen series. Deep chestnut-brown above, with two longitudinal light bands, one on each side of the back, below which is a series of black dots. Scales minutely dotted with black. Anterior half of the scutellae black; posterior half light-yellow.

Syn.—*Contia mitis*, B. & G. Catal. N. Amer. Rept. I, 1853, 110.

Descr.—The head is almost as deep as the body; the snout protruding beyond the lower jaw is obliquely truncated. The vertex plate is hexagonal; its sides nearly parallel and posteriorly very acute. The occipitals are elongated, truncated posteriorly, and slightly convex exteriorly. The postfrontals are large and angular, whilst the prefrontals are subangular and much smaller. The rostral is well developed, broad, and but slightly produced between the prefrontals. The nasal is quadrangular, longer than high, with the nostril in the middle, a little nearer the anterior than posterior edge. The loral is elongated and quadrangular, situated above the second labial. The anteorbital is angular and deep, situated above the third labial. The postorbital is angular, larger than the anteorbital, situated above the commissure between the fourth and fifth labials. The supraocularies are proportionally small and oblong. There is but one large, angular, and elongated temporal shield. The upper labials are seven in number; the anterior and posterior ones are smaller than in the middle of the series; the third and fourth are beneath the eye, forming a part of the orbit. There are, likewise, seven lower labials, the fourth being the largest. We observe two pairs of mental shields, the posterior pair being very small.

The body is slender, subcylindrical, broader than deep, covered with proportionally large scales, subelliptical in shape, posteriorly rounded or subtruncated. Those forming the exterior rows are conspicuously broader than the rest. The tail is short, conical, and tapering.

The abdominal scutellae are one hundred and fifty-five in number, the posterior one, or preanal, being divided. There are thirty-five subcaudal scutellae, disposed upon a double series.

The lighter bands of the back cover the fourth external row of dorsal scales; the series of black dots is immediately beneath, on the third row of scales. The scales in the exterior row are tipped with black. The head above is blackish-brown; beneath mottled with black, on a yellowish-green ground. The abdomen is transversely barred with black and yellow.

Loc.—This species inhabits California and Oregon.

Plate X, fig. 6, represents *Contia mitis*, size of life.
Fig. 7, is a profile of the head.
Fig. 8, an upper view; and
Fig. 9, an under view; whilst
Fig. 10, exhibits a front view of the same region.
Fig. 11, represents the scales of the body; and
Fig. 12, the vent, to show the preanal scutella.
Figs. 7–10, are magnified one-half of their diameter.

Genus BASCANION, B. & G.

Char. gen.—*Corpore et capite elongatis. Cauda longissima. Scutis postorbitalibus duobus; praeorbitali uno, et loreo uno; nasalibus duobus: nare in sutura sita. Squamis laevibus in septendecim series longitudinales dispositis. Scutella praeanali divisa. Scutellis subcaudalibus in duplicem seriem ordinatis. Colore in adulto aequali, in juniore vero maculato.*

Gen. Char.—Body and head elongated. Tail very long. Two postorbital and one anteorbital plates. One loral. Two nasals; nostril

between them. Scales smooth, disposed upon seventeen longitudinal series. Preanal scutella subdivided. Subcaudal scutellae disposed upon a double series. Adults unicolor; young blotched.

SYN.—*Bascanion*, B. & G. Catal. N. Amer. Rept. I, 1853, 93.

OBSERV.—The head is elongated, narrow, and deep; the eyes very large, and the vertex plate elongated and narrow also. The upper anteorbital is much larger than the lower one, which is situated in a notch between two labials. The fourth upper labial is produced behind the eye to meet the lower postorbital. The abdominal scutellae are from one hundred and seventy to two hundred in number, the preanal being divided; and ninety to one hundred and ten subcaudal ones, all of which are divided, or else disposed upon a double series.

The teeth, as far as our observations go upon the species described below, are pretty nearly equal in development upon the palate as well as upon the jaws; the premaxillary teeth being wanting.

BASCANION VETUSTUS, B. & G.

(Plate VIII, figs. 12–19.)

CHAR. SPEC.—*Capitis longitudine, trans scutos supraoculares, dimidium intervalli inter apicem rostri et extremitatem posteriorem scutorum occipitalium, adaequante. Inferiore postorbitali scuto in angulo inter quartam et quintam labialem sito. Colore supra fusco-olivaceo, infra palleo-viride.*

SPEC. CHAR.—Width of the head, across supraoculary plates, equal to half the distance between apex of rostrum and posterior extremity of occipital plates. Inferior postorbital in a notch, between the fourth and fifth labials. Olive-brown above; pale-green beneath.

SYN.—*Bascanion vetustus*, B. & G. Catal. N. Amer. Rept. I, 1853, 97.

DESCR.—The head is declivous upon the frontal region. The snout is rounded, protruding considerably beyond the lower jaw. The rostral plate is pyramidal and well developed; the prefrontal plates

are much smaller than the postfrontals, which extend somewhat to the sides of the head. The nasals are large; the prenasal a little larger than the postnasal; the nostril excavates equally the inner edge of each of these plates, and is contiguous above to the prefrontal plate. The loral is large and subpentagonal or trapezoid. The upper anteorbital extends to the upper surface of the head, in the shape of a triangle interposed between the postfrontal and the supraocular. The postorbitals are of equal size. There are six temporal shields, the anterior being the smallest. The upper labials are seven in number, increasing in size from the snout to the angle of the mouth, the seventh being equal to the fifth, and the sixth consequently the largest. The third and fourth are situated beneath the eye, constituting a part of the orbit. There are eight lower labials, the third and fourth being considerably larger than the rest. The posterior pair of mental shields is narrower than the anterior pair and tapering posteriorly. The scales are disposed upon seventeen longitudinal series, increasing in size towards the abdomen; the external series is considerably larger than the rest. Abdominal scutellae one hundred and sixty-six to one hundred and seventy-two; subcaudal scutellae seventy-nine to eighty-nine. The preanal scutella is subdivided, and the subcaudal ones disposed upon a double series. Sometimes the last two or three abdominal scutellae exhibit an irregular subdivision.

Above olive, tinged with brown; beneath pale-green; no black dots visible. There appears to be little if any black in the skin between the scales, although the basal edges of the scales themselves are slightly tinged.

Loc.—Specimens of this species were collected about Puget Sound, Washington Territory.

Plate VIII, fig. 12, represents *Bascanion vetustus*, size of life.

Figs. 13 and 14, are profile views of the head; fig. 13 from the left side, and fig. 14 from the right, both of these views being given on account of the labial plates varying in number.

Fig. 15, represents the head, from above.

Fig. 16, is the same region, viewed from beneath.

Fig. 17, represents the outline of the scales; and

Fig. 18, the vent, for the chief purpose of showing the preanal scutella.

Fig. 19, the dorsal scales.

Genus DENDROPHIS, Boie.

Gen. Char.—Body slender, very elongated, separated from the head by a quite narrow neck. Tail long and tapering. Head long, posteriorly broad; eyes large. Cephalic plates nine in number. Nostril situated between two plates. One loral, one anteorbital, and two postorbital plates. Scales smooth, or else not carinated. Belly flat; abdominal scutellae bent upwards, nearly at right angles on the sides; the preanal one either entire or subdivided. Subcaudal scutellae disposed upon a double series, and similarly bent upwards.

Syn.—*Dendrophis*, Boie, Isis, XX, 1826, 520.—Wagl. Nat. Syst. Amph. 1830, 182.—Dum. & Bibr. Erp. gén. VII, I, 1854, 193.

Observ.—One of the most characteristic traits of this genus consists in the series of scales on the middle region of the back, which are larger and differently shaped than the rest. The teeth are of uniform size or development; none, however, being found upon the premaxillary bones.

1. Dendrophis picta, Boie.

Spec. Char.—Dorsal scales disposed upon fifteen longitudinal series. Tail forming about the third of the total length. Preanal scutella entire. Upper regions green, with a yellowish-white lateral band margined with black. Sides of head and neck black. Beneath yellowish-white.

Syn.—*Coluber pictus*, Gm. *Linn.* Syst. Nat. III, 1788, 1116.—Seba, Thes. Nat. I, 1734. Tab. xcix.

Dipsas schokari, Kuhl, Beitr. 1820, 80.

Dendrophis picta, Boie, Isis, XX, 1826, 530 & 542; Erp. Java. Pl. xxxiv.—Schl. Ess. phys. Serp. I, 1837, 57; et II, 1837, 228. Pl. ix, figs. 5–7.—Dum. & Bibr. Erp. gén. VII, I, 1854, 197.

Leptophis pictus, Cantor, Journ. Asiat. Soc. XVI, 1847, 83.

Descr.—The head is elongated, depressed, and flattened upon its upper surface; it is ovoid in shape, when viewed from above. The

snout protrudes slightly beyond the lower jaw. The cleft of the mouth is descending from the tip of the lower jaw to a vertical line drawn behind the eye, hence ascending to its angle. The eye is large and circular; the pupil is circular also. The nostril occupies the upper portion, between two nasal plates, its superior rim being formed by the prefrontal plate. The occipital plates are more developed than any of the cephalic series; they are broadest anteriorly, diminishing in width posteriorly, rounded upon the latter margin, and nearly rectilinear laterally. The vertex plate is very broad anteriorly, tapering posteriorly, where it is rounded; the sides are somewhat concave. The supraocularies are obtusely triangular. The frontals are subquadrangular, the postfrontals being but a little larger than the prefrontals, if we except that portion which extends towards the loral region. The rostral is well developed, broad, and low. The postnasal is larger than the prenasal, both being contiguous inferiorly. The loral is narrow and elongated. The anteorbital is narrow inferiorly; it expands upwards, and appears on the upper surface of the head, under the shape of a small triangle. There are two postorbitals, the inferior one being much smaller than the upper. Four temporal shields of considerable development may be observed. There are eight upper labials; the anterior three are the smallest; the fourth and fifth constitute the inferior portion of the orbit, and are, together with the sixth and seventh, the largest; the ninth is smaller than the preceding. There are ten inferior labials; the symphyseal is small, triangular, and inclosed by the first pair of inferior labial plates, which are narrow and elongated; the fifth and sixth are the largest of the series; the posterior four diminish gradually towards the angle of the mouth, whilst the anterior four increase in size from the symphyseal backwards. The mental shields are well developed; the posterior pair is narrower and more elongated than the anterior pair. Scale-like shields may be observed on the sides of the throat.

The body is very elongated and very slender, deeper than broad throughout its whole extent, and most developed upon the middle region. The belly is nearly flat, and laterally keeled, a result of the bent of the scutellae. The tail, which forms about the third of the entire length, is very slender and tapering to a point; it is likewise deeper than broad throughout its entire length; its inferior surface is flattened, keeled on each side like the belly, owing to the flexions

upwards of the subcaudal scutellae. The dorsal scales, which are smooth, are disposed upon fifteen longitudinal series; the middle series is composed of larger scales than the lateral series, from which they likewise widely differ in shape. While the lateral scales are narrow and elongated, the dorsal ones are subelliptically hexagonal. There are four series of scales upon the tail at its origin, and one only towards its termination. The abdominal scutellae, one hundred and sixty-nine in number, are well developed, the preanal being entire like the rest. There are one hundred and nineteen subcaudal scutellae, all divided, else disposed upon a double series.

The ground color is of a brownish-green, with a lateral yellowish-white or whitish band extending over the two external series of scales and bordered with black. The inferior black border covers partly the outer series of scales and partly the abdominal scutellae, whilst the upper one extends along the margin of the second series of scales. The side of the head, in advance of the eye, is spotted with black. The postocular and temporal regions, as well as the sides of the neck, are black. The inferior regions are unicolor.

Loc.—A specimen of this species, about three feet in length, was procured at Singapore.

2. Dendrophis prasinus, Grd.

(Plate XII, figs. 7–10.)

Char. spec.—*Squamis dorsualibus, postice emarginatis, in tridecim series longitudinales dispositis. Scutella praeanali divisa. Colore passim viride; linea albida secundum carinam abdominalem protensa.*

Spec. Char.—Dorsal scales posteriorly emarginated and disposed upon thirteen longitudinal series. Preanal scutella divided. Uniformly green, with a whitish line along the abdominal ridge.

Syn.—*Dendrophis prasinus*, Grd. in Proc. Acad. Nat. Sci. Philad. August, 1857.

Descr.—The head is elongated, depressed, subovoid when seen from above, and tapering forwards. It is twice as long as broad and

one-third broader than deep. The mouth is deeply cleft, concave downwards, a little behind the orbit. The snout is slightly protruding beyond the lower jaw. The eye is large and subelliptical, its horizontal diameter being somewhat more than half the distance between its anterior rim and the extremity of the snout. The cephalic plates are all conspicuously developed, the occipitals being the largest of the set, and nearly as wide anteriorly as the vertex plate is long; the latter is subpyramidal, with its rounded summit directed backwards, whilst its sides are slightly concave upon their middle. The supraocularies are a little longer than the vertex plate, obtusely subtriangular in shape, broadest posteriorly, where they meet the occipitals. The postfrontals are larger than the prefrontals, subquadrangular when viewed from above, and extending to the sides of the head, as far as the loral, between the postnasal and the anteorbital. The prefrontals are exteriorly rounded, narrowest in front. The rostral is broad and low, and scarcely seen in an upper view of the head. There are two nasals, with the nostril between, encroaching, however, more upon the postnasal than the prenasal, which appears a little larger. The loral is elongated and narrow, rounded upon its upper edge. The anteorbital, narrow upon its base, widens as it ascends, thrusting itself between the supraocular and the postfrontal, and appearing upon the upper surface of the head. There are two postorbitals, the inferior one being the smallest. An elongated temporal shield may be seen between the postorbitals, posterior upper labials, and the occipital plate, followed by two others more scale-like in their appearance. The upper labials, eight in number, are increasing in size posteriorly; the fourth and fifth constitute the inferior rim of the orbit, the anteorbital resting upon the fourth, and the inferior postorbital upon the fifth. On the right side of our specimen the seventh and eighth upper labials are united into one plate. The symphyseal is rather small and triangular. There are nine, mayhap ten, inferior labial plates; the first one is vertically elongated, and meets its fellow so as to inclose the symphyseal, thus separating it from the anterior pair of mental shields; the second is the smallest; they increase in size to the sixth, which is broadly developed and the largest of all, hence they diminish posteriorly. The posterior mental shields are very long and slender, longer and narrower than the anterior pair. The sides of the throat are covered with elongated scale-like shields.

The specimen described is four feet four inches in total length. The body is quite slender, thickest upon its middle region, and deeper than wide throughout its whole extent. It is convex or arched superiorly and nearly flat beneath. The tail, which measures fourteen inches, is very slender and tapering into a point; like the body itself, it is deeper than wide from its base to its extremity. The scales are quite large, imbricated and emarginated upon their posterior free edge; imbricated and disposed upon thirteen longitudinal rows, on the anterior third of the body, and upon eleven rows posteriorly. In the dorsal row they are subhexagonal in shape; in the lateral rows subrhombic, the one adjoining the abdominal scutellae being much broader (deeper) than the rest. At the origin of the tail there are but three rows of scales, the middle row scarcely differing from the lateral ones, they all being broader than on the sides of the body. On the latter third of the tail the longitudinal rows of scales are reduced to two.

We observe two hundred, broad, abdominal scutellae, the preanal one being subdivided and very convex exteriorly. The subcaudal scutellae are all divided, one hundred and fifteen in number.

The color is uniformly green, with a light-yellowish line on each side of the abdomen, intersecting the abdominal scutellae upon their flexion along the sides, and extending likewise under the tail along the marginal keel. The skin under the scales is black.

Loc.—This species was collected about Sydney, Australia.

Plate XII, fig. 7, represents *Dendrophis prasinus*, size of life.
Fig. 8, is a profile of the head.
Fig. 9, an upper view of the same.
Fig. 10, a view of the head, from beneath.
Fig. 11, the dorsal scales.

Genus PITUOPHIS, Holbr.

Gen. Char.—Body subcylindrical, deeper than broad. Head elongated, ovoid; cleft of mouth curved. Vertex plate elongated. Supraocularies large, subtriangular. One or two pairs of postfrontal plates, an internal and an external pair, both elongated. Prefrontal

pair subquadrate. A small loral. Three or four postorbitals; two anteorbitals or one only. Temporal shields small, scale-like. Dorsal rows of scales twenty-nine to thirty-five, variable in some species; those on the back carinated, on the sides smooth. Abdominal scutellae, two hundred and nine to two hundred and forty-three; preanal one large and entire. Subcaudal scutellae all divided. Ground color whitish or reddish-yellow, with a triple series of dorsal black blotches, largest in the middle series. Several series of smaller blotches on the sides. Abdomen unicolor or maculated, with an outer row of blotches. Head of the same color as the body, maculated with black; a narrow band of black across the upper surface between the eyes, and a posterior vitta on each side, extending obliquely from the eye to the angle of the mouth. A black, vertically elongated, patch is often seen beneath the eye.

Syn.—*Pituophis*, Holbr. N. Amer. Herp. IV, 1842, 7.—B. & G. Catal. N. Amer. Rept. I, 1853, 64.—Dum. & Bibr. Erpét. gén. VII, I, 1854, 232.

Pityophis (Holbr.), Hallow. Proc. Acad. Nat. Sci. Philad. VI, 1852, 181.

Churchillia, B. & G. Rept. in *Stansbury*, Expl. Vall. of Gr. Salt Lake of Utah, 1852, 350.

Observ.—The species of this genus generally attain a very large size. They are known in the United States, to which they chiefly belong, under the common appellations of pine, bull, and pilot snakes. They are of terrestrial habits. Quite timid in spite of their great size, they will hiss at the approach of the slightest danger or alarm, by suddenly inflating their lungs and letting the air escape again. Their body and head both, will, in such cases, be somewhat flattened, though never to the same extent as in *Heterodon*, or "blowing viper," as the latter are commonly called. Under ordinary circumstances, the vertical diameter of their body is greater than the transversal, the reverse of what we observe in the subaquatic garter-snakes (*Eutaenia*). The head, in some instances, is quite narrow and tapering anteriorly. Oftentimes there are three pairs of frontal plates, one more than is usually the case: a prefrontal pair and two postfrontal pairs, the latter placed side by side.

The teeth are equally developed and rather inconspicuous. There are none upon the premaxillary bones.

1. Pituophis catenifer, B. & G.

(Plate VIII, figs. 1–7.)

Spec. Char.—One pair of postfrontal plates; two anteorbitals and three postorbitals. Loral large. Dorsal rows of scales thirty-one in number; the external four rows smooth. Tail forming the seventh of total length. Frontal black band conspicuous. Postocular vitta of a jet black, reaching the margin of the jaw between the penultimate and last labial plate. Ground color greyish-yellow. A triple series of dorsal black blotches, sixty-one in number, from head to origin of tail, forming a continuous chain all along the back. A series of large, subcircular blotches along the middle of the flanks. Middle of abdomen unicolor, with a series of black spots on each side.

Syn.—*Coluber catenifer*, Blainv. Nouv. Ann. Mus. d'hist. nat. III, 1834, Pl. xxvi, fig. 2, 2 *a*, 2 *b*.

Pituophis catenifer, B. & G. Catal. N. Amer. Rept. I, 1853, 69.

Descr.—The head is subelliptical, flattened above. The vertex plate is long, nearly equilateral, except posteriorly, where it is triangular. The supraocularies are large, dilated anteriorly, tapering posteriorly. The prefrontals are large and subcircular. The rostral is broad, even with the surface of the snout. The nasals are nearly equal in size, and the nostril placed between them, near the edge of the prefrontal. The loral is subtrapezoid, proportionally larger than in the other species of the genus. There are two anteorbitals; the upper one very large; the lower one small and situated immediately above the fourth labial. We observe three postorbitals of nearly equal size. The temporal shields, ten to twelve in number, are slightly larger than the contiguous scales. There are eight upper labials; the seventh is the largest. The lower labials are twelve in number, the fifth and sixth being the largest. The posterior pair of mental shields is very narrow, extending beyond the sixth lower labial.

The dorsal scales are narrow and rather acute upon their posterior extremity; they constitute thirty-one longitudinal series, the outer one of which composed of scales considerably larger than the rest.

They are carinated on the dorsal region and smooth laterally upon four series on each side. The abdominal scutellae are narrow, two hundred and thirty in number; the preanal large and entire. The subcaudal scutellae are disposed upon a double series of seventy-one in each. The tail itself is very tapering.

Ground color above fuscous, with a triple series of black blotches along the back, seventy-eight in number, the sixty-first opposite the anus; seventeen on the tail. The blotches of the medial series are proportionally very large, quadrangular, longer than broad, covering six rows of scales, and the half of the adjoining rows, embracing longitudinally five or six scales. A narrow light space of one scale exists between each blotch. The adjoining series is composed of much smaller blotches, alternating and covering three rows of scales confluent with the middle ones, thus forming a continuous chain on the back, and inclosing entirely the light spaces between the blotches. A series of subcircular or oblong blotches runs conspicuously along the middle of the flanks, on the fourth, fifth, sixth, and seventh rows of scales. These are eighty-eight in number, the seventy-first opposite the anus, and ten along the anterior half of the tail. The five first blotches are elongated, and exhibit a tendency towards forming a vitta or band. From the middle region of the body to the tail, two obsolete series of very small blotches are seen alternating with the series of the flanks, one above and one below. The abdomen is yellowish, unicolor, except a series of blotches on the extremities of the scutellae, extending sometimes to the outer row of scales.

Loc.—A specimen, thirty-five inches in total length, was collected at San Francisco, California.

Plate VIII, fig. 1, represents *Pituophis catenifer*, size of life.
Fig. 2, is a profile of the head.
Fig. 3, an upper view of the same.
Fig. 4, the head, seen from beneath.
Fig. 5, a front view of the same region.
Fig. 6, exhibits the shape and number of rows of scales.
Fig. 7, the vent and surrounding scutellae.

2. Pituophis wilkesi, B. & G.

(Plate IX, figs. 1–7.)

Char. spec.—*Scutis postfrontalibus in dua paria dispositis. Squamis dorsualibus in* 29–31 *series longitudinales ordinatis; tribus seriebus externis laevibus. Cauda circiter sextam longitudinis partem efficiente. Vitta postoculari, super ultimam labialem, usque ad oris angulum protensa. Colore flavido, dorsuali serie subquadratorum et duabus lateralibus seriebus subcircularum fuscarum macularum, notato.*

Spec. Char.—Two pairs of postfrontal plates. Dorsal series of scales, twenty-nine to thirty-one; the three outer series smooth. Tail about the sixth of total length. Postocular vitta running over the last labial to the angle of the mouth. Ground color yellowish, with a dorsal series of subquadrate, and two lateral series of subcircular blotches.

Syn.—*Pituophis wilkesii*, B. & G. Catal. N. Amer. Rept. I, 1853, 71.

Descr.—The head is elongated, subelliptical, subpyramidal or subconical. The occipital plates are much longer than broad, and longer than either the vertex or the supraoculars. The vertex plate is pentagonal, laterally concave, and posteriorly tapering; its length is greater than the width of its anterior margin. The external postfrontals are sometimes divided into two distinct plates, one of which having been called upper loral. The internal postfrontals are elongated, very narrow posteriorly, sometimes subdivided also. The rostral is broad, superiorly rounded and not engaged between the prefrontals. The nasals are of equal size, with the nostril intermediate, and situated nearer the frontal than the labials. The loral is of moderate development. The lower anteorbital is small, and situated upon the commissure between the fourth and fifth upper labials. The postorbitals are nearly of equal size, and generally they constitute a continuous chain with the anteorbitals, thus excluding the labials from the orbit, into which, however, the fifth occasionally enters. The temporal shields are scarcely distinguishable from the ordinary scales. The upper labials are eight or nine in number; the fourth or fifth occasionally entering into the orbit, the penultimate being the largest.

There are twelve or thirteen lower labials; the fifth or sixth the largest, and the six posterior ones very much reduced in size.

The dorsal scales are elliptical, disposed upon twenty-nine to thirty-one longitudinal series, the outer three series being perfectly smooth, whilst a slight carination may be observed upon the fourth and fifth series. The carinae on the remaining series are not very conspicuous.

The tail is conical and tapering. The abdominal scutellae are numerous, from two hundred and nine to two hundred and fifteen, the preanal one being entire. The subcaudal scutellae range between fifty-six and seventy-two, and are disposed upon a double series.

The ground color is yellowish, with a dorsal series of subquadrate blotches, about ninety in number, twenty of which are on the tail. These are deep-brown, margined with black anteriorly, entirely black posteriorly; these blotches cover transversely eight or nine rows of scales, embracing longitudinally five to seven scales on the anterior region of the body, and two or three posteriorly. The spaces between the blotches are of the uniform width of one scale for the whole length of the body, decidedly narrower than in other species. A lateral series of blotches on each side of the medial, covering three rows of scales, and alternating with the medial series. A series of blotches along the middle of the flanks opposite to the blotches of the medial series of the back. On the anterior part of the body the lateral blotches are elongated, and occasionally combine into a band or vitta behind the neck. On the anterior third of the body, an indistinct series of black spots may be seen, between the scutellae and the outer series of lateral blotches. Inferior surface of head and abdomen dull yellowish-white, with two series of distant blotches, the outer series more conspicuous than the inner one, and extending to the tip of the tail.

In the young, the middle region of the abdomen is unicolor, and the external series of spots only exists, which, together with the series on the middle of the flanks, are most conspicuous.

Loc.—Specimens of this species were collected in Washington Territory, as far north as Puget Sound, the largest of which measures nearly forty-two inches.

Plate IX, fig. 1, represents *Pituophis wilkesi*, size of life.
Fig. 2, is a profile view of the head.
Fig. 3, a front view of the same.

Fig. 4, an upper view of the head.
Fig. 5, a lower view of the same.
Fig. 6, the vent and preanal scutella.
Fig. 7, the dorsal scales.

Genus CALLIRHINUS, Girard.

Char. gen.—*Capite et corpore colubriformibus. Rostro subconico, ultra maxillam inferiorem protenso. Scuto verticis elongato, rostrali convexo. Scutis nasalibus duobus; nare in sutura sita. Scutis loreis duobus, praeorbitali uno, postorbitalibus duobus; labialibus tertio et quarto in orbitam productis. Squamis modicis, laevibus. Scutella praeanali divisa. Scutellis subcaudalibus in seriem duplicem ordinatis.*

Gen. Char.—Head and body colubrine. Snout subconical, protruding beyond the lower jaw. Vertex plate elongated. Rostral convex. Two nasal plates, with nostril between them. Two loral plates. One anteorbital and two postorbitals. Third and fourth upper labials entering into the orbit. Scales moderate, smooth. Preanal scutella divided. Subcaudal scutellae disposed upon a double series.

Syn.—*Callirhinus*, Grd. in Proc. Acad. Nat. Sci. Philad. August, 1857, p. 182.

Observ.—This genus is related to *Rhinechis* and *Pituophis;* the labial plates are less numerous than in the latter two genera, and so also are the series of dorsal scales. The teeth are uniform and moderately developed. The eye is large, and the pupil circular. The preanal scutella is subdivided, as in *Rhinechis.*

Callirhinus patagoniensis, Grd.

(Plate XII, figs. 1–6.)

Char. spec.—*Squamis in novemdecim series longitudinales dispositis. Colore olivaceo, nigro-maculato.*

SPEC. CHAR.—Scales disposed upon nineteen longitudinal series. Ground color olivaceous, maculated with black.

SYN.—*Callirhinus patagoniensis*, GRD. in Proc. Acad. Nat. Sci. Philad. August, 1857, p. 182.

DESCR.—The head is but moderately elongated, depressed, flattened upon the occipital region, and slightly declivous forwards upon the frontal region. Viewed from above its shape is subovoid or subelliptical; the temporal region passing gradually to the neck, which is more slender than the body. The snout is subconical, and protrudes beyond the lower jaw. The cleft of the mouth is ascending towards its angles. The occipital plates are broadly developed, a little longer than broad anteriorly, and tapering considerably. The vertex plate is as long as the occipitals, maintaining its width posteriorly, where it is subangular; its sides being slightly concave. The supraoculars are likewise well developed, being as long as the vertex plate and but a little narrower anteriorly than posteriorly; they are slightly concave laterally. The frontal plates are subangular, the postfrontals being larger than the prefrontals. The rostral is elevated, subpyramidal, concave beneath. There are two well-developed and elevated nasals, with the nostril between them, encroaching more upon the postnasal. We observe two quadrangular loral plates, the uppermost being the smallest of the two; its presence prevents the postfrontal from advancing much to the side of the snout. There is but one anteorbital, quite narrow inferiorly, widening towards the supraocular ridge, hence sending a triangular process to the upper surface of the head, between the supraocular and the postfrontal. The postorbitals are two in number, the upper one being the largest of the two. The temporal shields, six in number, are conspicuous; the anterior one is the largest. There are seven well-developed upper labials, increasing in size from the first to the sixth inclusively; the seventh is larger than the fourth; the third and fourth enter into the orbit. The symphyseal is acutely triangular, and inclosed by the first pair of inferior labials, which are elongated and sub-lanceolated. We observe ten inferior labials, increasing in size from the second to the sixth; the others diminish posteriorly, being horizontally elongated, instead of vertically; the tenth is the smallest of all. There are two pairs of mental shields, nearly equal in length, but the anterior pair is broader and consequently larger. Elongated scale-like shields occupy the region of the throat.

The body is elongated, subcylindrical, being flattened beneath. The tail, which forms about the fifth of the total length, is subconical and tapering. The scales are perfectly smooth and imbricated, disposed upon nineteen longitudinal series, nine of which may still be counted upon the base of the tail. Those constituting the series adjoining the abdominal scutellae are broad, and much larger than the rest, which are sub-lanceolated, except on the second series, where they assume the subrhombic shape of the outer series. The skin is black. The abdominal scutellae are well developed transversely; they are one hundred and eighty-seven in number, the preanal one being subdivided, broad, and convex exteriorly. The subcaudal scutellae are sixty-nine in number, and disposed upon a double series.

We have examined two specimens of this species, one measuring thirty-six inches in total length, and the tail separately seven inches and a half; the other, whose total length was twenty-three inches, gave five inches and a half to the tail. The dorsal scales are disposed upon nineteen longitudinal rows or series; the abdominal scutellae, in the largest specimen, are one hundred and eighty-seven, and the subcaudals sixty-nine pairs, whilst in the smallest, the abdominals are one hundred and seventy-seven, and the subcaudals seventy-six. The preanal scutellae being subdivided.

The color above is olivaceous, with the base and tip of the scales black, hence the appearance of transverse, oblique, black, interrupted lines; sometimes the upper region of the body has a maculated appearance, from the spreading of the black over the base of the scales. The edges of the cephalic plates are black also. The inferior region is of a uniform pale-yellow, with a black spot at the posterior and external margin of the scutellae, hence a series of small black spots on either side of the abdomen, and which may be traced to a certain distance along the tail.

Loc.—Specimens of this species were collected on the coast of Patagonia, about the mouth of the Rio Negro.

Plate XII, fig. 1, represents *Callirhinus patagoniensis*, size of life.
Fig. 2, is a profile view of the head.
Fig. 3, an upper view of the head.
Fig. 4, the same region, seen from beneath.

Fig. 5, exhibits the shape and the number of dorsal rows of scales.
Fig. 6, represents the vent and the surrounding scutellae.

Genus SIBYNON, Fitz.

Gen. Char.—The generic characters, as derived from the species described further on, are as follows: Supracephalic plates normal; two nasals; no loral; one anteorbital, or else one loral and no anteorbital; two postorbitals. Scales smooth, disposed upon fifteen longitudinal series. Preanal scutella entire; subcaudal scutellae disposed upon a double series.

Syn.—*Sibynon*, Fitz, Syst. Rept. I, 1843, 27.
Petalognathus, Dum. & Bibr. Erp. gén. VII, i, 1854, 463.

Observ.—This genus is one of the many subgenera into which Fitzinger subdivides his genus *Dipsadomorphus*. The characters assigned to each by their author are, so far, left with us to conjecture. The typical species is *Coluber nebulatus*, of Linnaeus, originally found at Surinam, and subsequently in Mexico, and still more recently in Peru.

Sibynon nebulatus, Fitz.

(Plate XI, figs. 11–16.)

Spec. Char.—Body compressed. Prefrontal plates very small. Back transversely black blotched, with a narrow white or yellow space between the blotches, widening towards the sides, which are maculated, as well as the abdomen.

Syn.—*Coluber nebulatus*, Linn. Mus. Adolph. Fred. 1754, 32, Tab. xxiv, fig. 1; Syst. Nat. ed. X^{a}, I, 1758, 222; et ed. XII^{a}, I, 1766, 388.—Gmel. *Linn.* Syst. Nat. XIII$_{a}$, I, iii, 1788, 1107.

Coluber sibon, Linn. Syst. Nat. ed. X^{a}, I, 1758, 222; et ed. XII^{a}, I, 1766, 388.—Gmel. *Linn.* Syst. Nat. ed. XIII^{a}, I, iii, 1788, 1107.

Sibon nebulatus, Fitz. N. Class. Rept. 1826, 60.

Dipsas nebulata, Boie, in *Oken's* Isis, XX, 1827, 550.—Schleg. Ess. Phys. Serp. I, 1837, 162; & II, 275, Pl. xi, figs. 14 and 15.—Filipp. Bibliot. Italian. XCIX, 1840.

Petalognathus nebulatus, Dum. & Bibr. Erp. gén. VII, i, 1854, 464.

OBSERV.—The synonyms not quoted above, may easily be found in the systematic writers on the subject. Had we had more ample materials at our command, we would have investigated more thoroughly the history of the present species, represented in the collection of the United States Exploring Expedition by a single specimen, yet immature.

DESCR.—The head is depressed, superiorly flattened, ovoid when viewed from above, and quite distinct from the neck. The snout is rounded and the jaws even. The cleft of the mouth is large, subconcave beneath the eye, and not raised upwards towards its angle. The eyes are well developed and circular, and the nostrils situated between two plates. The occipital plates are large, admitting the posterior extremity of the vertex plate between their commissure. The vertex plate is broad and short. The supraoculars are narrower anteriorly than posteriorly, and nearly as long as the vertex plate, though extending a little more forwards. The postfrontals are quite large, subangular, extending somewhat to the loral region. The prefrontals are very small, subtriangular, and declivous forwards. The rostral is subconical, concave inferiorly, occupying exclusively the anterior portion of the snout. The prenasal is larger than the postnasal; the nostril apparently perforates equally both plates. There is no loral. A large and subquadrangular anteorbital is contiguous to the postnasal, being a little longer than deep. We observe two postorbitals on the left and three on the right, but the inferior two are very small compared to the upper one, so in fact the normal number is probably two, the uppermost being, at any rate, the largest. The temporal shields are scale-like, and a little larger than the scales themselves. There are six upper labials, the third and fourth entering into the orbit; the fifth and sixth are the largest, horizontally elongated, whilst the anterior four are deeper than long, and nearly equal in size, with the exception of the fourth, which is a little larger than the anterior three. The symphyseal is small and subtriangular, entirely inclosed by the first pair of lower labials, which are well developed. There are ten pairs of lower labials; the second, third, and fourth are smaller than the first, and slightly increasing in size backwards; the fifth is the largest; the posterior five are irregular in size, and elongated horizontally. Three pairs of subquadrangular

mental shields may be observed extending to the anterior abdominal scutella. There are a few lateral scale-like shields on the throat.

The neck and body are slender, subcylindrical, a little deeper than wide. The tail is short, conical, and very slender. The scales are subrhomboid, disposed upon fifteen longitudinal series, eight of which may yet be observed upon the base of the tail. Those in the lateral series are but slightly larger than the rest. The abdominal scutellae are narrow, one hundred and eighty in number, the preanal one being large and entire. The subcaudal scutellae are disposed upon a double series, sixty-three in number.

Dorsal rows fifteen; abdominal scutellae one hundred and eighty; subcaudal scutellae sixty-three; total length nine inches; tail two inches.

The upper surface of the head is yellowish-brown, with a black spot upon the external margin of the supraocular plates. A black horse-shoe-like marking exists upon the occipital plates. The posterior two upper labials are almost black; the temporal region is spotted likewise. The upper part of the body is covered with transverse black patches, separated by narrow whitish spaces, giving to the body a semi-annulated appearance. On the posterior half of the body these patches are interrupted laterally, and in most instances the divided blotches of the sides alternate with the dorsal one. The abdomen is dull-whitish, laterally maculated, the extremity of which maculae corresponding to the white spaces, which expand on the sides, owing to the narrowing of the black patches upon the same region.

Loc.—Found coiled up under a stone, in the Amancaes Valley, near Lima, Peru.

Plate XI, fig. 11, represents *Sibynon nebulatus*, size of life.
Fig. 12, is a profile of the head.
Fig. 13, an upper view of the same.
Fig. 14, an under view of the head also.
Fig. 15, represents the outline of the scales.
Fig. 16, the vent and adjoining scutellae.
Figs. 12–16, are magnified about half their diameter.

Tropidonotus junceus, Cantor.

(Plate XIII, figs. 1–6.)

Spec. Char.—Dorsal scales disposed upon nineteen longitudinal series. Greyish-olive above, with a double series of black dots along the back; a series of yellowish spots exteriorly to the former, and a lateral series of black spots. Abdomen yellowish; margin of the scutellae maculated with blackish-brown.

Syn.—*Tropidonotus junceus*, Cantor, in Journ. Asiat. Soc. XVI, 1847, 93.

Observ.—This species is allied to *T. spilogaster*. The specimen which we describe is not a full-grown one, and exhibits a coloration somewhat at variance in its details with the one described by Cantor. Thus, the head above is of a shining-brown upon the snout only, and the oblique gamboge band, from the angle of the mouth, extends no further than the sides of the neck. The dorsal and lateral series of black dots probably disappear in the adult, for the lateral series is already very obsolete, especially from the middle of the body posteriorly.

Descr.—The head is depressed, ovoid when viewed from above, and quite distinct from the neck, which is slender as well as the body. The eyes are very large and the nostrils also. The mouth is deeply cleft, forming an open curve. The occipital plates are very large. The vertex plate is also well developed, much longer than broad, six-sided, subangular anteriorly, acutely triangular posteriorly, with its sides parallel. The supraoculars are rather narrow and elongated, broadest posteriorly, and longer than the vertex plate. The postfrontals are subquadrangular, larger than the prefrontals, and sending off a small process to the loral region. The prefrontals are subtriangular, being exteriorly rounded. The rostral is broad, superiorly rounded, inferiorly concave, and occupies exclusively the rostral region proper, its edge alone being seen in an upper view of the head. The prenasal is subquadrangular, much larger than the postnasal, and bearing the nostril upon its posterior edge. The postnasal is vertically elongated and subcrescentic. The loral is subelliptical

and higher than long. The anteorbital is narrower inferiorly than superiorly. There are three postorbitals; the uppermost is slightly larger than the others. The upper labials, nine in number, gradually increase in size from the first to the seventh, hence diminish again posteriorly, though the eighth and ninth are as large as the fifth and sixth; the fourth, fifth, and sixth enter into the orbit, the fourth but slightly. The symphyseal is small and triangular, entirely inclosed by the first pair of lower labials. The latter are ten in number, increasing in size to the eighth; the ninth and tenth are narrow and elongated. There are two pairs of mental shields, both narrow and elongated, the posterior pair more so than the anterior one, and diverging from their base, whilst, in the latter pair, they are disposed side by side, and contiguous upon their entire length. The throat is covered with elongated scales, varying in size.

The dorsal scales are all carinated, and disposed upon nineteen longitudinal rows. The row adjoining the abdominal scutellae is composed of broader scales than the rest, which are narrow and lanceolated, the more so as they approximate the middle line of the back. They constitute eight or nine rows upon the base of the tail; the latter is conical and tapering, not forming the third of the entire length. The keels do not extend quite to the tip of the scales, which are slightly notched or else emarginated. The abdominal scutellae are very much developed transversely; there are a hundred and forty of them, the preanal one being subdivided. The subcaudal scutellae are disposed upon a double series and eighty-six in number.

Dorsal row nineteen; abdominal scutellae one hundred and forty; subcaudal scutellae eighty-six; total length eighteen inches; tail five and a half inches.

The upper surface of the head is blackish-brown, vermiculated with greenish-olive. The labials are yellowish, with a vertical black streak upon their commissure. The body above is greyish-olive, with a double series of black dots along the middle of the back, exteriorly of which, and along the upper portion of the sides, is a series of transversely elongated yellowish or whitish spots, beneath which is another series of black spots. Upon the neck the spots are much larger, making this region appear almost entirely black. The upper part of the tail is blackish-brown. The abdominal region is yellowish, the anterior margin of the scutellae maculated with blackish-brown, from the middle of the body posteriorly: anteriorly the outer portion alone is

spotted, with a tendency of the spots to appear upon every other scutella only. As they approximate the neck, under which these spots increase, they cover two scutellae, leaving two unicolor ones intervening. The anterior half of the subcaudal scutellae is black; the posterior half is yellowish.

Loc.—From Singapore.

Plate XIII, fig. 1, represents *Tropidonotus junceus*, size of life.
Fig. 2, is a side view of the head.
Fig. 3, an upper view of the head.
Fig. 4, the head, seen from beneath.
Fig. 5, represents the dorsal scales.
Fig. 6, the vent and surrounding scutellae.

Genus EUTAENIA, B. & G.

Char. gen.—*Scutis cephalicis normalibus. Nare inter duos scutos nasales sita. Scuto praeorbitali uno, vel duobus; postorbitalibus duobus vel tribus. Squamis carinatis in novendecim vel viginti unam series longitudinales dispositis. Scutellis abdominalibus centum et quadraginta vel centum et septuaginta; subcaudalibus quinquaginta vel centum et viginti, in duplicem seriem ordinatis. Scutella praeanali divisa. Colore obscuro, tribus pallidis longitudinalibus vittis notato; inter quas maculae alternantes vel tessellatae inveniuntur. Abdomine unicolore.*

Gen. Char.—Cephalic plates normal. Nostrils between two plates. One or two anteorbitals; two or three postorbitals. Scales carinated, constituting nineteen or twenty longitudinal series. Preanal scutella entire; subcaudal scutellae disposed upon a double series. Abdominal scutellae one hundred and forty to one hundred and seventy; subcaudals fifty to one hundred and twenty. General color, three light stripes on a darker ground; intervals with alternating or tessellated spots. Abdomen without square blotches.

Syn.—*Eutaenia*, B. & G. Catal. Rept. N. Amer. I, 1853, 24; and in *Marcy's* Expl. Red River of La. 1855, 190.

Observ.—The body is stoutish in certain species and slender in others, capable of being somewhat depressed or flattened in water, into which they occasionally enter, though most of the species are terrestrial; many of them being ovo-viviparous. The skin is very extensible.

The genus, which includes the so-called garter and striped snakes, seems to be peculiar to North America, and the analogue of the Tropidonoti of the ancient world.

1. Eutaenia infernalis, B. & G.

(Plate XIV, figs. 11–16.)

Char. spec.—*Corpore gracilissimo. Capite et oculo magnis. Scuto praeorbitali uno; postorbitalibus tribus, inaequalibus. Squamis dorsualibus in novemdecim series longitudinales dispositis; omnibus conspicue carinatis. Supra nigro colore; serie flavo-rubescentium macularum cum obsoleta vitta laterali, ipsaque vitta cum palleo-viridescente colore laterum et abdominis, confluentibus.*

Spec. Char.—Body very slender. Head and eye large. One anteorbital; three unequal postorbitals. Nineteen dorsal rows of scales, all conspicuously carinated. Above black: a series of reddish-yellow spots, confluent with the indistinct lateral stripe, itself confluent with the greenish-white of the sides and abdomen.

Syn.—*Coluber infernalis*, Blainv. Nouv. Ann. Mus. d'hist. nat. III, 1834, 59, Pl. xxvi, figs. 3 & 3 *a*.

Eutaenia infernalis, B. & G. Catal. N. Amer. Rept. I, 1853, 26.

Descr.—One single specimen of this species was collected. It is about fourteen inches in total length and very slender. The eye is very large. The anteorbital plate preserves its width downwards, its anterior margin being subrounded or subconvex. The postorbitals, three in number, are unequal in their development: the lowermost being quite small and the middle one considerably the largest. The loral is well developed, subquadrangular, or trapezoid. The postnasal is smaller than the prenasal, in the posterior margin of which the nostril exclusively opens. The rostral is large, six-sided, though

of a triangular aspect. The postfrontal extends to the upper half of the loral region. The vertex plate is subhexagonal, quite broad, maintaining its width posteriorly. There are seven upper labials; the third and fourth situated beneath the eye; the fifth and sixth are the largest of the series. The lower labial plates are ten in number. The anterior meets its fellow under the chin, and thus interposes itself between the triangular symphyseal and the anterior pair of mental shields. The second labial is the smallest of all; they increase in size to the sixth, which is the largest, diminishing again from the seventh, posteriorly. The posterior pair of mental shields is longer and more slender than the anterior pair, which are contiguous upon their inner edge, where three or four elongated scales may be observed, intervening between the posterior pair.

The tail, which is very slender, constitutes about the fourth of the total length.

The dorsal scales are disposed upon nineteen longitudinal rows; the external row, though larger, is carinated like the rest. On the tail the scales are likewise carinated. There are one hundred and sixty-six abdominal scutellae, and eighty-five pairs of subcaudal ones.

As to the coloration, there is a vertebral line of yellowish-white, composed of one and two half rows of scales, on each side of which is a blackish stripe, not encroaching upon the light colored stripe along the second and third lateral rows of scales. Above the latter the black is interrupted by about one hundred and ten subtriangular spots of reddish-yellow or reddish-white. The abdomen and exterior row of dorsal scales are greenish-white, tinged posteriorly with a slate hue. A minute black spot, more or less covered by the incumbent scales, may be seen on each abdominal scutella, near its extremity.

Loc.—From the neighborhood of Sacramento River, California.

Plate XIV, fig. 11, represents *Eutaenia infernalis*, size of life.
Fig. 12, is a profile of the head.
Fig. 13, an upper view of the same.
Fig. 14, the head, seen from beneath.
Fig. 15, exhibits the dorsal scales.
Fig. 16, the vent and surrounding scutellae.
Figs. 12–16, are magnified about one diameter.

2. Eutaenia pickeringi, B. & G.

(Plate XIII, figs. 14–20.)

Char. spec.—*Corpore gracili. Capite et oculo modicis. Scuto praeorbitali uno; postorbitalibus tribus, aequalibus. Squamis dorsualibus in novemdecim series dispositis, omnibus carinatis. Supra nigro; infra lapidis fissilis coloris. Vittis lateralibus irregularibus, confluentibus, cum pallidis intervallis inter fuscas maculas.*

Spec. Char.—Body slender. Head and eye moderate in size. One anteorbital; three postorbitals, of equal development. Dorsal scales disposed upon nineteen rows, all carinated. Black above; slate color beneath. Lateral stripe irregular, confluent, with the light-colored intervals between the dark spots.

Syn.—*Eutaenia pickeringii*, B. & G. Catal. N. Amer. Rept. I, 1853, 27.

Descr.—The cephalic plates present the same general aspect as in *E. infernalis*. A feature, however, peculiar to the present species, may be observed amongst the postorbital plates, which are nearly of equal size, the middle one, mayhap, a little smaller than the others. The nostril encroaches somewhat upon the postnasal, which is nearly equal in size with the prenasal. The labial plates are conspicuously developed. The abdominal scutellae average from one hundred and fifty-eight to one hundred and seventy, and the subcaudal ones from seventy-three to eighty-seven.

The inequality between the exterior dorsal row of scales and the rest is scarcely appreciable. The former is rather the larger, and little or not at all keeled; the second row is about the same size with the rest. The eyes are larger, and the head shorter than in *E. leptocephala*, from the same locality.

This species exhibits great variations in color, principally in regard to the amount of black on the abdomen, and the extent of the stripes. The most strongly marked specimen is of an intense black, tinged with bluish below. There is a very narrow greenish-white vertebral line, beginning at the nape, where it occupies one and two half-scales, and gradually narrows to the keel of the middle dorsal row, becoming obsolete at the anus. The keels of the second and third rows of scales show a faint line of greenish-white, only perceptible on close examina-

tion. The lores, labials, cheeks, and head beneath, are greenish-white, gradually shading into the slate hue of the abdomen.

In another specimen, with the general color very dark, the vertebral line occupies one and two half-scales throughout. The black on each side appears formed by the confluence above of about seventy-six spots from head to anus, each spot from one and a half to two scales long. The lateral stripe is on the second lateral row of scales, of a greenish-white color, and confluent with the intervals of the spots, also of the same color. The stripe is not well defined, but swells and narrows like a knotted cord. The exterior row of dorsal scales and the sides of the abdomen are deep blue-black, becoming greenish toward the middle of the abdomen; anteriorly, the color shows more white.

Loc.—This species was collected up Puget Sound, Oregon.

Plate XIII, fig. 14, represents *Eutaenia pickeringi*, size of life.
Fig. 15, is a profile of the head.
Fig. 16, an upper view of the head.
Fig. 17, the head, seen from beneath.
Fig. 18, a front view of the head.
Fig. 19, exhibits the dorsal scales.
Fig. 20, is the vent, with its surrounding scutellae.

3. Eutaenia leptocephala, B. & G.

(Plate XIII, figs. 7–13.)

Char. spec.—*Capite gracili, supra plano. Scutis praeorbitalibus duobus, postorbitalibus tribus, aequalibus. Squamis dorsualibus in series novemdecim dispositis, super majorem caudae partem obsolete carinatis: duabus externis seriebus, in utroque latere, inaequalibus, quam caeteris tamen valde amplioribus; extrema serie laeve. Supra pallide fusco-olivaceo; parvis conspicuis et fuscis maculis in una serie, a capite usque ad caudae incipium, ordinatis.*

Spec. Char.—Head slender, plane above. Two anteorbitals, and three postorbitals of equal development. Dorsal scales in nineteen series, scarcely carinated on the greater portion of the tail; the two external rows, on each side, unequal, but considerably larger than the

rest; outermost smooth. Color above light olive-brown, with conspicuous small dark spots, in a series, from head to origin of the tail.

SYN.—*Eutaenia leptocephala*, B. & G. Catal. N. Amer. Rept. I, 1853, 29.

DESCR.—The head is narrow and depressed; its upper surface being nearly plane, from the occiput to the prefrontal plates. The labials are rather narrow. The eye is rather small. There are two nearly equal and large anteorbitals, and three subquadrangular postorbitals, almost equal also in size. The dorsal scales are disposed upon nineteen rows; the exterior row broader than usual, and not carinated; the second row is smaller than the first, but broader also than usual, and but faintly carinated; the remaining rows are all distinctly carinated. The abdominal scutellae are from one hundred and forty-four to one hundred and forty-nine in number, and the subcaudal ones from fifty-nine to sixty-six pairs.

The color is dull light olive-brown or light chocolate above; pale greenish-slate beneath. When the epidermis is removed, the subjacent skin of the abdomen is seen minutely punctured and clouded with black, so as to impart this latter color to the whole, except near the sides. A vertebral dull yellowish line, covering but a single row of scales, appears more prominent than the rest. On each side of this vertebral line are two series of subquadrate black blotches, about one hundred and thirty from the head to the vent, on about every other scale or even closer, and showing very conspicuously on the clear ground color. The bases of all the scales on the sides of the body are more or less black, occasionally showing beyond the incumbent edges. There is little or no indication of a lateral stripe. The lower series of black spots is continued into a faint line along the side of the head to the orbit.

In one specimen, the coloration is less defined, showing a greenish-white color above, with tessellated small spots of black.

LOC.—Found, with the preceding species, up Puget Sound, Oregon.

Plate XIII, fig. 7, represents *Eutaenia leptocephala*, size of life.
Fig. 8, is a profile of the head. Fig. 9, an upper view;
Fig. 10, an under view; and
Fig. 11, a front view of the same region.
Fig. 12, shows the dorsal scales.
Fig. 13, the vent, and surrounding scutellae.

4. Eutaenia ordinoides, B. & G.

(Plate XIV, figs. 1–4.)

Char. spec.—*Corpore brevissimo. Scuto praeorbitali uno; postorbitalibus tribus. Squamis dorsualibus in series novemdecim vel viginti unam dispositis, extrema serie ampliore, carinata. Squamis caudalibus valde carinatis. Vitta una dorsuali, una quoque laterali, flaveis; duabus nigrarum macularum seriebus in utroque latere: colore inter maculas seriei superioris fusco-rubescente; inferioris vero, olivaceo.*

Spec. Char.—Body rather stout. One anteorbital; three postorbital plates. Dorsal scales in nineteen or twenty-one rows; exterior one largest and carinated. Caudal scales strongly carinated. A yellow dorsal stripe, and one on each side. Flank with two series of black spots: between the lower series reddish-brown; between the upper series olivaceous.

Syn.—*Tropidonotus ordinoides*, B. & G. Proc. Acad. Nat. Sci. Philad. VI, 1852, 176. *Eutaenia ordinoides*, B. & G. Catal. N. Amer. Rept. I, 1853, 33.

Descr.—This species attains quite large dimensions. The body is very stout, and the tail small and tapering. The postnasal plate is much smaller than the prenasal, in which the nostril is exclusively situated. There is one anteorbital and three postorbitals, nearly alike. The eye is of but moderate development. The fourth and fifth labials constitute the inferior rim of the orbit; the sixth and seventh are the largest; their entire number is eight, whilst the lower labials are ten, the fifth and sixth of which are the largest.

The dorsal scales are disposed upon nineteen or twenty-one longitudinal series, all of which are carinated, the external series being much larger than the rest. The abdominal scutellae are one hundred and sixty-one to one hundred and sixty-seven in number; the subcaudal ones averaging between sixty-seven and eighty-five.

A very strongly defined dorsal stripe of a yellowish color, occupies one and two half-scales. A second line, less distinct, exists along the second and third rows of scales. On each side, between the dorsal and lateral stripes, are two series of subquadrate black spots, eighty to eighty-four in number, arranged alternately, and occupying portions

of several scales; the spots in the lower series are larger. Intervals between the lower series of spots occupied by reddish-brown scales, in shape and color somewhat resembling the dead leaves of the hemlock (*Abies canadensis*). Intervals between the upper series olivaceous-brown, more or less blended with the black. Beneath uniform greenish-white, with the bases of the scutellae black, as are also the scales on the exterior rows; this color, however, rarely shows beyond the margin of the incumbent scales.

In one specimen, which is much larger than the others, the dorsal spots form a rather narrow margin to the broad dorsal stripe, and are more or less confluent with the ground color. The space between the lower row of spots is pale reddish. Dorsal scales in nineteen series. Ninety spots from head to anus.

The characters are very strongly marked, and easily recognized.

Loc.—Specimens of this species were collected in California.

Plate XIV, fig. 1, represents *Eutaenia ordinoides*, size of life.
Fig. 2, is a profile of the head.
Fig. 3, an upper view of the head.
Fig. 4, an under view of the same region.

5. Eutaenia vagrans, B. & G.

(Plate XIV, figs. 5–10.)

Char. spec.—*Scuto praeorbitali uno; scutis postorbitalibus duobus. Squamis dorsualibus in unam et viginti series dispositis; omnibus, extrema tantum inconspicue, carinatis. Supra palleo-fusco, infra lapidis fissilis coloris. Vitta dorsuali per unam squamarum seriem. Duabus seriebus parvarum nigrarum macularum in utroque latere.*

Spec. Char.—One anteorbital; two postorbitals. Dorsal scales in twenty-one rows, all of which carinated, the outermost inconspicuously. Above light-brown; beneath slate color. Vertebral light line on a single row of scales. Two series of small black spots on each side.

Syn.—*Eutaenia vagrans*, B. & G. Catal. N. Amer. Rept. I, 1853, 35.

OBSERV.—This appears to be a widely spread species over the North American continent. The specimen brought home by the Expedition is about twelve inches in total length, that is, somewhat below the average size.

DESCR.—The anteorbital plate is quite narrow inferiorly. Of the two postorbitals, the inferior one is by far the highest. The inferior rim of the orbit is formed by the fourth and fifth labials.

Compared with its nearest neighbor, *E. leptocephala*, it differs in having the exterior row of dorsal scales large and carinated, the next row scarcely, if at all, larger than the rest. The caudal scales are strongly carinated. The labial plates being very much developed. It is provided likewise with twenty-one rows of dorsal scales, and one hundred and six, not one hundred and thirty, spots, in series, from head to anus. The head is larger and much arched.

The abdominal scutellae are one hundred and sixty-one in number; the subcaudal ones fifty-three.

Above light-brown; beneath slate-color (sometimes black), with the margins of the scutellae black. A dorsal line occupying a single row of scales, of a dull yellowish color, the tint occasionally running into the adjoining row. On each side of this, are two series of small black spots, occupying generally a single scale, and varying from ninety-five to one hundred and five, from the occiput to the anus. The upper series runs along the second row of scales from the vertebral row; the lower series along the seventh.

LOC.—The specimen figured is from Puget Sound, Oregon.

Plate XIV, fig. 5, represents *Eutaenia vagrans*, size of life.
Fig. 6, is a profile of the head.
Fig. 7, an upper view of the same region.
Fig. 8, a view from beneath.
Fig. 9, exhibits the dorsal scales.
Fig. 10, the vent and adjoining scutellae.
Figs. 7–10, are magnified about one half their diameter.

Genus CANTORIA, Girard.

Char. gen.—*Corpore subcylindrico, altiore quam latiore, longissimo. Cauda modica, incipio crassa, postice conicali. Capite depresso, nec a corpore discreto. Ore modico. Oculis minimis. Scuto praefrontali, angusto; nasali unico, nare in ejus medio sita; loreo uno. Scutis orbitalibus oculam circumdantibus. Squamis modicis, laevibus, lucidis, in novemdecim series longitudinales dispositis. Scutella praeanali divisa. Scutellis subcaudalibus in duplicem seriem ordinatis.*

Gen. Char.—Body subcylindrical, deeper than broad, and very much elongated. Tail moderate, thick upon its base, and conical posteriorly. Head depressed, continuous with the body. Mouth moderate. Eye very small. An odd, narrow prefrontal plate. Nostril in one single plate, situated upon the upper surface of the head. One loral. Orbitals constituting a complete circle around the eye. Scales moderate, smooth, shining, disposed upon nineteen longitudinal series. Preanal scutella divided. Subcaudal scutellae disposed upon a double series.

Syn.—*Cantoria*, Grd. Proc. Acad. Nat. Sci. Philad. August, 1857, 182.

Observ.—The species upon which this genus is founded, has not been observed, as far as we know, by the authors of the "Erpétologie générale."

Cantoria violacea, Grd.

(Plate XI, figs. 7–10.)

Spec. Char.—An anteorbital; a sub- and a postorbital. Labials very large. Ground color above reddish-violet, the scales being edged with white. Beneath pearl-colored.

Syn.—*Coronella violacea*, Cantor, Proc. Zool. Soc. Lond. VII, 1839, 50.
Cantoria violacea, Grd. Proc. Acad. Nat. Sci. Philad. August, 1857, 182.

Observ.—The specimen which we describe appears to constitute a variety of coloration, similar to what is often observed in *Ophibolus*

sayi, of the United States, the upper region being generally of a uniform shining reddish-violet, and sometimes exhibiting transverse, narrow, obsolete, light bands or bars.

DESCR.—The head is of moderate development, almost continuous with the neck. It is depressed, nearly plane above, and slightly declivous forwards. The snout is obtuse and rounded; the upper jaw protrudes beyond the lower. The eyes are very small, and situated towards the upper surface of the head, and directed laterally outwards. The nostril is small also, perforating one single plate. The mouth forms an oblique curve, regularly ascending towards its angle.

The occipital plates are the largest of the cephalic series; they are elongated, anteriorly angular, irregularly rounded exteriorly. The vertex plate is hexagonal, as broad as it is long, engaging posteriorly between the occipitals. There is a pair of subcircular or polygonal postfrontals of moderate size, and an odd, sublanceolated prefrontal, having on its sides a nasal, reaching anteriorly the rostral, and contiguous posteriorly to the postfrontals. The nasals are situated on the upper surface of the snout, bearing the perforation of the nostrils towards their posterior third. They are elliptically or quadrangularly elongated, and of considerable development. The rostral shows but very little in an upper view of the head; it is six-sided, having nearly a square base, and a triangular summit. The loral is well developed, subtrapezoid in shape, and showing in an upper view of the head. There is an anteorbital, nearly as large as the supraocular, and deeper than broad. A small subangular postorbital. Two infraorbitals, the posterior small and subangular, the anterior nearly as large as the anteorbital, exist under the eye, thus preventing the labials from entering into the orbit. The orbit, therefore, is formed of four plates, an upper and a lower, an anterior and a posterior. There is a large and elongated temporal shield, behind which are several scales, a little larger than the true scales of the neck. The upper labials are five or six in number, the first, fifth, and sixth being broader than the rest; all but the sixth are deeper than broad. The first is subtriangular, situated beneath the nasal. The symphyseal is small, subtriangularly obtuse, and inclosed by the first pair of inferior labials, which are narrow and elongated. There are eight lower labials, much smaller than the upper; the fifth is the largest, hence, they diminish anteriorly and posteriorly. There

are two pairs of sublanceolated mental shields, nearly equal in size. The throat is covered by scale-like shields.

The body is very long, subcylindrical, deeper than wide, a little thicker upon its middle, diminishing very gradually forwards and backwards. The tail is short, forming a little less than the eighth of the entire length; it tapers into a point, remaining deeper than wide throughout. The scales are smooth, disposed upon nineteen longitudinal series, subrhomboid, broader on the middle of the sides than on the dorsal line, where they have a tendency to a sublanceolated shape, broader also than on the series adjoining the abdominal scutellae; they are smaller on the neck and larger on the tail than on the body; at the base of the tail, they are disposed upon eleven or twelve longitudinal series. The abdominal region being quite narrow, the scutellae are transversely short, though otherwise well-developed. They are two hundred and seventy-eight in number, the last two being subdivided. The subcaudal scutellae are disposed upon a double series, sixty-four in number.

The total length of the specimen figured and described is fifty inches; six inches belonging to the tail.

The upper regions of the head, body, and tail are reddish-violet. A few yellowish-white spots may be observed on the head, whilst transverse lines of the same hue are seen on the neck and body, covering but one scale, inclosing three or four scales of the ground color. These lines become very obsolete posteriorly, but, wherever they exist, they divide the color of the back into transverse, oblong, or subelliptical areas. The inferior region of the head and body is pearl-colored; the subcaudal region being maculated with the tint of the back.

Loc.—The specimen figured and described was collected in the neighborhood of Singapore.

Plate XI, fig. 7, represents *Cantoria violacea*, size of life.
Fig. 8, is a profile of the head.
Fig. 9, an upper view; and
Fig. 10, an under view of the same region.

Liophis merremi, Wagl.

(Plate XI, figs. 1–6.)

Observ.—There was but one specimen of this species collected, thirteen inches and a half in length, and consequently immature. It is the *Coluber doliatus*, of the Prince of Neuwied, now generally considered as a mere variety of coloration of *C. merremi*, of the same author. For its synonymy we refer to the "Erpétologie générale," of Duméril and Bibron.

Descr.—The head is quite depressed, subovoid when viewed from above. The snout is obtusely rounded, and projects somewhat beyond the lower jaw. The nostril is situated between two plates. The eyes are of moderate development, and circular in shape. The mouth is deeply cleft, concave posterior to the eye, and ascending towards its angle. The occipitals are moderately developed, tapering posteriorly into an acute angle. The vertex plate is as long as the occipitals, elongated, five-sided, slightly concave laterally, acute-angled posteriorly, engaging between the occipitals. The supraoculars are shorter than the vertex plate, narrower anteriorly than posteriorly, and slightly arched above the eye. The postfrontals are angular, much larger than the prefrontals, and sending a process to the loral region. The prefrontals are subangular. The rostral is semi-elliptical, concave beneath, elevated so as to be seen in an upper view of the head. The nasals are well developed, equally perforated by the nostril; they are superiorly acute, and may be seen in an upper view of the head: the prenasal between the rostral and the prefrontal, and the postnasal between the prefrontal and the postfrontal. The loral is trapezoid, its longest diameter being obliquely vertical. There is but one anteorbital, very narrow inferiorly, widening superiorly, and sending a triangular process to the upper surface of the head, nearly contiguous to the anterior margin of the vertex plate, between the postfrontal and the supraocular. We observe two postorbitals, the inferior one being smaller than the upper. There are two elongated temporal shields, placed one behind the other, and contiguous to the occipital plate. The upper labials are eight in number on the right side, and nine on the left; they increase in size from the rostral backwards; the sixth and seventh or seventh and

eighth are much larger than the rest; the last is somewhat smaller than the penultimate and the ante-penultimate. The triangular symphyseal is entirely inclosed by the first pair of lower labials, which are narrow and acute posteriorly. There are twelve lower labials, increasing in size to the sixth, which is the largest; they again diminish posteriorly, the eleventh and twelfth being the smallest of all. We observe two pairs of mental shields; the anterior pair is longer and broader than the posterior pair, which is acute, diverging, so as to admit some of the scale-like shields which cover the throat.

The neck is narrower than the head, and a little more slender than the body, which is subcircular, being a little deeper than wide; the latter tapers posteriorly, passing into the pointed tail, which constitutes about the fifth of the entire length. The scales are subrhomboid, and disposed upon nineteen longitudinal series, seven of which may yet be observed upon the base of the tail. The abdominal scutellae are transversely well-developed, one hundred and seventy-four in number, the preanal being divided. The subcaudal scutellae are disposed upon a double series, fifty-eight in each.

The head, anterior to the occipital plates, is deep blackish-brown; the occipital region is dull yellow. The upper surface of the body and tail exhibits a series of black transverse patches, occupying from three to four and sometimes five scales, giving it a semi-annulated appearance; these patches, however, are narrower towards the sides; sometimes they are irregular and interrupted. A whitish-yellow space, of the width of about two scales, widening towards the sides, alternates with these black patches. The inferior region is yellowish-white, duller than on the upper surface, semi-annulated with black, alternating with the black patches of the back. The inferior half-rings are often interrupted along the mesial line of the abdomen.

Loc.—From the neighborhood of Rio de Janeiro, Brazil.

Plate XI, fig. 1, represents *Liophis merremi*, size of life.
Fig. 2, is a side view of the head.
Fig. 3, an upper view;
Fig. 4, an under view of the same region.
Fig. 5, represents the dorsal scales.
Fig. 6, the vent and adjoining scutellae.
Figs. 2–6, are magnified about half their diameter.

Dromicus temminckii, Dum. & Bibr.

Spec. Char.—Middle region of the back exhibiting a broad band of deep brown or black, on each side of which is a series of whitish dots. Upon the sides, a band of lighter brown. Tip of scales not covered by these bands, black.

Syn.—*Coronella chamissonii*, Wiegm. in Nov. Act. nat. cuv. XVII, I, 1835, 246, Pl. XIX.

Psammophis temminckii, Schleg. Ess. Physion. Serp. I, 1837, 156; & II, 1837, 218, Pl. VIII, figs. 14 and 15.—Guich. in *Gay*, Hist. de Chile, II, 1848, 83.

Dromicus temminckii, Dum. & Bibr. Erpét. gén. VII, I, 1854, 663.

Taeniophis tantillus, Grd. in Proc. Acad. Nat. Sci. Philad. VII, 1854, 227; and in *Gilliss*, U. S. N. Astr. Exped. to S. Hemisph. II, 1855, 215, Pl. XXXVII, figs. 7–12 (young).

Descr.—The head is elongated, depressed, subovoid when viewed from above; the occipital region passing gradually to the neck. The frontal region is slightly declivous; the snout round, and the jaws even. The mouth is deeply cleft, forming a very open curve. The eyes are very large, and subcircular; their horizontal diameter being comprised about once and a half across the cephalo-ocular region. The nostrils are quite small, situated upon the middle of the commissure between two nasal plates, and encroaching a little more upon the prenasal than upon the postnasal. The vertex plate is elongated, sometimes lanceolated, at others subhexagonal, slightly concave laterally, and more truncated anteriorly than posteriorly. The occipitals are much larger than the vertex plate; they are rounded exteriorly. The postfrontals are irregularly angular or rounded, encroaching slightly upon the loral region. The prefrontals, smaller than the postfrontals, are subtriangular, and externally rounded. The rostral is broad and low, being but imperfectly seen in an upper view of the head; it is arched above, and concave beneath. The nasals are subquadrangular, nearly equal sized. The loral is elongated and subtrapezoid. There is but one anteorbital, inferiorly narrow, superiorly broad, sending a very small triangular process to the upper surface of the head, without, however, isolating entirely the postfrontals from the supraoculars, as previously observed upon immature specimens. The supra-

oculars are well developed, having the form of an elongated obtuse triangle, narrowest anteriorly. There are two postorbitals; the uppermost subquadrangular, larger than the lower, which is narrow and rounded. Two elongated, plate-like, temporal shields, and several others, scale-like, may be observed. The upper labials are eight in number, the fourth and fifth forming the inferior rim of the orbit; the fifth, sixth, and seventh are the largest; the fourth and eighth are nearly equal (in size, not in shape), the anterior three being the smallest. There are ten, mayhap eleven, lower labials, and a small triangular symphyseal, inclosed by the first pair of labials; the second is smaller than the first and third, the fifth and sixth being the largest. The posterior pair of mental shields is more slender than the anterior pair.

The body is elongated, subcylindrical, diminishing gradually in thickness backwards. The tail is subconical, elongated, and slender. The scales are smooth, disposed upon nineteen longitudinal series on the body, eight upon the base of the tail, and four only towards its tip. The series adjoining the abdominal scutellae are larger than on the back; their form is elongated, sublanceolated on the body, subrhomboid, and shorter upon the tail. The abdominal scutellae are of moderate development, and slightly convex posteriorly; the preanal is subdivided. The subcaudal scutellae are disposed upon a double row; their numbers, as observed upon two specimens, are as follows:

Abdominal scutellae 189 and 199; subcaudal scutellae 101 and 106. Total lengths three feet two inches and two feet three inches; tail eleven inches and seven and a half inches.

The upper surface of the head is deep brown. A dorsal band of the same color extends from the occiput to the tip of the tail, covering sometimes five, at others three, series of scales; when only three, the adjoining row, on either side, is alternately dotted with white and black. A narrow band of brown extends from the loral region across the eye, along the temporal region and the neck, becoming sometimes very obsolete along the sides of the body. The space not covered by these bands is yellowish-brown; every scale bearing a black spot. A superciliary bright yellowish fillet passes over the temporal region, separating the dorsal from the lateral deep-brown band. The labials are of a bright yellow, occasionally margined with black. The abdominal region is yellowish-white, spotted with blackish, the spots being

quite crowded upon the extremities of the scutellae, so as to assume a maculated appearance.

Loc.—Specimens of this species were obtained in the hilly region behind Valparaiso, Chile.

Lygophis elegans, Tsch.

Observ.—The genus *Lygophis*, proposed by Fitzinger, is characterized in the "Fauna Peruana," where the present species is described and figured.

Syn.—*Lygophis elegans*, Tsch. Faun. Peruan. Herp. 1845, 53, Pl. vi.

Descr.—The head is elongated, very much depressed, flattened above, subovoid in an upper view, and quite distinct from the neck. The snout is narrow and rounded, protruding slightly beyond the lower jaw. The cleft of the mouth is concave beneath the eye. The nostril is situated between two plates, and the eye, very large, is subelliptical in shape. The occipital plates are large; the vertex plate is elongated, slightly concave laterally, as broad posteriorly as anteriorly; its posterior acute extremity being admitted between the commissure of the occipitals. The supraoculars are nearly as long and quite as broad as the vertex plate, upon the middle of their length. The postfrontals are angular, one-third larger than the subquadrangular prefrontals, and extend somewhat to the loral region. The rostral is subpyramidal, and very concave beneath. The postnasal is a little larger than the prenasal, the nostril perforating equally both plates. The loral is subtrapezoid, with its narrowest angle directed towards the eye. There is but one anteorbital, inferiorly narrow, widening upwards, and sending a triangular projection to the upper surface of the head, without, however, meeting the vertex plate. We observe two postorbitals, equal in size. There are six or seven temporal shields; the anterior elongated; the others scale-like, though larger than the scales themselves. The upper labials are seven in number, the third and fourth entering into the orbit; the first is the smallest; they increase in size from the second to the fifth, which is the largest, hence diminishing posteriorly. The symphyseal is small, triangular, entirely

inclosed by the first pair of lower labials, which are narrow and lanceolated. The lower labials themselves are eight in number; the second is the smallest; they increase in size to the fifth, which is the largest, hence diminishing posteriorly; the fourth, however, is nearly as large as the fifth. The mental shields are slender; the anterior pair, acute upon both extremities, are a little shorter than the posterior pair, which are rounded posteriorly, and diverging in order to admit a few of the small and numerous scale-like shields which cover the throat.

The neck and body are slender and subcircular. The tail is very much tapering towards a filiform point. The scales are subrhomboid, slightly carinated on the back, disposed upon seventeen longitudinal series, eight of which may be observed upon the base of the tail. The series adjoining the abdominal scutellae is smooth, and much larger than the others. The abdominal scutellae are rather narrow, two hundred in number, the preanal one being subdivided; the subcaudal scutellae are disposed upon a double series, about one hundred and fifteen in number.

The total length of the specimen described is nine and a half inches, giving two and a half inches to the tail.

The ground color is bluish-grey above. A double series of roundish deep-brown spots, with a marginal black fillet, may be observed along the dorsal region, contiguous upon their inner margins, with a tendency now and then to alternate; towards the posterior portion of the body, they emerge into a uniform band, which may be traced tapering down the tail, still margined with a black fillet. On each side of the body is a series of much smaller spots, sometimes opposite to one another, at others, alternating with the dorsal series, and anteriorly with a vitta of the same hue, which exists along the temporal region, across the eye to the nostril. The upper surface of the head being merely spotted. The scales of the two external rows are light brown upon their middle. The extremities of the abdominal scutellae are spotted, which spots constitute an abdominal series on each side. The inferior region, otherwise, is of a uniform yellowish hue.

Loc.—A small specimen was obtained at San Lorenzo, coast of Peru.

Amphiesma rhodomelas, Dum. & Bibr.

Spec. Char.—Above brick-red, with a dorsal black or brown band, bifurcated upon the hind part of the neck. On the sides a series of black dots.

Syn.—*Tropidonotus rhodomelas*, Schleg. Ess. Physion. Serp. I, 1837, 167; et, II, 1837, 310, Pl. xii, figs. 10 & 11.
Amphiesma rhodomelas, Dum. & Bibr. Erpét. gén. VII, i, 1854, 737.

Descr.—The head is rather short, broad across the temporal region, and narrow anteriorly; its upper surface being convex. The snout is bluntly rounded, projecting over the lower jaw. The nostril is situated between two plates. The eyes are very large and circular, with a large and circular pupil also. The mouth is deeply cleft, concave posterior to the orbit, and ascending towards its angle. The occipital plates are elongated, twice as broad upon their middle as they are long. The vertex plate is large, obtusely six-sided, tapering posteriorly, in the general appearance of an isoceles triangle, and shorter than the occipitals. The supraoculars are of the same length as the vertex plate, rather narrow anteriorly, and slightly arched above the eye. The postfrontals are much larger than the prefrontals, extending somewhat to the sides of the head; seen from above, they have a subquadrangular aspect. The prefrontals are rounded exteriorly. The rostral is broad and low, semicircular, convex above, concave beneath. The prenasal is smaller than the postnasal; the nostril, which is very large, perforates equally both plates. The loral is subtrapezoid. We observe three anteorbitals; the uppermost is the largest, and angular in shape, and does not extend to the upper surface of the head; the middle one is much smaller than the preceding; the third or lower one is exceedingly small, resting above the commissure between the third and fourth labials. There are four postorbitals, the uppermost being the largest, the others diminishing gradually in size; the lower one, however, is more conspicuous than its fellow at the anterior rim of the orbit. Five or more temporal shields may be observed, the anterior two being elongated, and much more developed than the rest. The upper labials are eight in number; the first is very small, and situated beneath the prenasal; they increase in size from the second to

the sixth, which is the most developed; the seventh is nearly as large as the sixth, whilst the eighth is nearly equal to the fifth; the fourth and fifth constitute the inferior rim of the orbit. The lower labials are ten in number, the first pair being narrow and elongated, inclosing entirely a small and obtusely triangular symphyseal; the second and third are the smallest of the set; there is an increase in size hence to the seventh, which is the largest; the others diminish again posteriorly; the tenth is quite reduced. We observe two pairs of mental shields; the anterior pair is broader and shorter than the posterior pair, which diverges to admit the anterior abdominal scutella, leaving no space between them for scale-like shields.

The neck is very slender, and quite distinct from the head. The body is circular, and slender also, a little thicker upon its middle than towards its extremities. The tail, which is subconical and tapering, constitutes about the fifth of the entire length. The scales are lanceolated, carinated, and slightly larger towards the abdomen than on the middle of the back. The keels extend to the very tip of the scales, which are disposed upon nineteen longitudinal series upon the middle of the body, and seven or eight upon the base of the tail. The scales upon the occipital region are irregular in shape, and smooth; they are small, and carinated near the origin of the tail. The abdominal scutellae are very much developed transversely, in the direction of their length; they are also quite broad, slightly convex, one hundred and thirty-four in number, the preanal being subdivided, and more convex posteriorly than the others; the anterior one is the broadest, and anteriorly acute. The subcaudal scutellae are disposed upon a double series, and about fifty in each.

The handsome brick-red color of the upper parts of the body, which is observed during life, has given way to a purplish-grey, in specimens preserved in spirits, and the pale-red of the abdomen to a dull reddish-yellow. The extremities of the scutellae are colored like the back, and provided moreover with a small black spot, constituting a series on either side of the abdomen. The black dorsal vitta is now blackish-brown, covering one entire row of scales and the half of the adjoining two rows, and along the tail two half rows only; anteriorly, where the vitta widens into a club-shaped spot, forked upon its anterior edge, there are but two series of scales on the sides of the neck, which are not covered by it.

Loc.—The specimen described was obtained in the vicinity of Singapore.

Xenodon ancorus, Grd.

Char. spec.—*Scutis praeorbitalibus et postorbitalibus duobus. Squamis laevibus in septendecim series longitudinales dispositis. Supra spadiceo, cum maculis transversis per notaeum ordinatis, et in capite macula ancoriforme; infra unicolori.*

Spec. Char.—Two anteorbital and two postorbital plates. Scales smooth, disposed upon seventeen longitudinal series. Brownish-red above, with transverse blotches along the back, and an anchor-shaped spot upon the head. Beneath unicolor.

Syn.—*Xenodon ancorus*, Grd. in Proc. Acad. Nat. Sci. Philad. August, 1857, 182.

Observ.—This species is allied to *X. purpurescens*, from which it differs by the presence of seventeen dorsal rows of scales instead of nineteen, and by the pattern of coloration also.

Descr.—The head is rather short, stoutish upon the occiput, subconical forwards, and truncated in front; it is declivous laterally and posteriorly, passing gradually to the neck, which is nearly as thick as the body. The rostral plate is large, subpyramidal, deeply emarginated upon its base, and extending to the upper surface of the head. The prefrontals are smaller than the postfrontals, all of which are subangular in shape. The supraoculars are angular, narrower anteriorly than posteriorly. The vertex plate is hexagonal and broad. The occipitals are the largest of the cephalic plates. The nasal is well developed, broader anteriorly than posteriorly, near which margin the nostril is perforated. The loral is conspicuous, and angularly subelliptical. The inferior anteorbital is very small; the upper one is angular, equal in size and shape to the upper postorbital, whilst the lower postorbital is narrower and more elongated or elevated, resting upon the sixth labial. The eye is of medium size, with a circular pupil. There are three or four temporal shields, larger than the scales immediately behind. The upper labials are eight in number, and much more deve-

loped posteriorly than anteriorly, the fourth and fifth entering into the orbit; the sixth and seventh are the largest of the series. There are likewise eight inferior labials; the first one meeting its fellow of the opposite side, thus inclosing a small subtriangular symphyseal; the second is the smallest; the fifth the largest; the fourth and sixth being nearly equal. Two pairs of mental shields, the anterior pair largest, are separated from the abdominal scutellae by two pairs of large and broad scales.

The body is subcylindrical, somewhat deeper than broad, convex above, and flattened beneath. The dorsal scales are perfectly smooth, and disposed upon seventeen longitudinal series, smallest and narrowest along the middle region of the back, and subrhomboid in shape, whilst they are broad and subtrapezoid on the sides. The abdominal scutellae are one hundred and sixty in number, the preanal being undivided, like the rest. The subcaudal scutellae are subdivided, disposed upon a double series of forty-five in each. The tail is subconical, tapering into an acute point, and forming nearly the sixth of the total length of the specimen before us.

The ground color, as observed upon specimens preserved in alcohol, is of a greyish or brownish-red. There are seventeen blotches of a greyish hue, margined with black, and encircled with a white fillet, extending along the dorsal region; they are transversely subelliptical, broadest upon the medial line of the back, where they generally cover five scales; laterally, they do not extend over the two outermost rows of scales, whilst along the tail they reach the scutellae. A few isolated, very small spots, exist along the sides on the intervals between the blotches. An anchor-shaped blotch may be observed upon the head and neck; its curved branch is placed across the snout, passes over the anterior portion of the orbit and eye, extending to the jaw, whilst the main branch increases in width towards the neck, where it bifurcates, sending off a branch to either side of the neck. An isolated temporal vitta, of a deep-brown hue, may likewise be observed. The inferior region is whitish, unicolor, the extremities of the scutellae alone being dotted with red.

Loc.—A specimen of this species was collected at Manilla.

ERYTHROLAMPRUS VENUTISSIMUS, Boie.

OBSERV.—We prefer referring our readers to the "Erpétologie générale," of Duméril and Bibron, for the synonymic references to this species, rather than transcribe them here from that work, since we are acquainted with but one variety, the third, and hence not convinced of its identity with the other varieties.

DESCR.—The head of the unique specimen of this species which we have before us being in a very mutilated condition, we are not prepared to describe either its shape or its structure; it is even with some difficulty that we have ascertained the genus to which it belongs. The vertex plate, the supràoculars, and the frontals alone are discernible; the former is very broad, subpentagonal, being slightly concave laterally, and rounded off posteriorly. The supraoculars are elongated, and somewhat narrower anteriorly than posteriorly. The prefrontals are much smaller than the postfrontals.

The neck is a little smaller than the posterior part of the head. The body increases slightly in thickness to the middle region, hence diminishing gradually towards the origin of the tail. The latter, which constitutes about the eighth of the total length, is subconical in shape, tapering rapidly posteriorly.

The scales, which are large, are disposed upon fifteen longitudinal series; they are elongated, subrhomboid, and slightly tiled when the skin is not overstretched. The skin itself is of a dull whitish hue. Seven rows of scales may be observed upon the base of the tail, and two only towards its extremity; they are more truncated and consequently shorter upon the latter region than on the body. The abdominal scutellae are two hundred and one in number; the preanal one being subdivided. There are forty-eight pairs of subcaudal scutellae.

The vertex is black. There is an occipital black ring obsoletely connected under the throat. Twelve more black rings are observed encircling entirely the bòdy, from the neck to the origin of the tail, and covering three or four scales and abdominal scutellae; the twelfth ring is double, half of which belonging to the tail. The intervening space between these rings embraces from twelve to fifteen scales, which are tipped with black, the ground color being yellowish or

whitish, and generally much altered by a protracted immersion in alcohol. Two double black rings may be observed upon the tail, the tip of which is reddish. The abdomen, between the black rings, is unicolor.

Loc.—Collected at Rio de Janeiro, Brazil.

Genus CERBERUS, Cuv.

Gen. Char.—Cephalic plates small. Nostrils and eyes on the upper surface of the head; eyes rather small. Labials large and elevated, though not entering into the orbit. Dorsal scales lanceolated and carinated. Abdominal scutellae large; preanal one subdivided. Subcaudal scutellae disposed upon a double series.

Syn.—*Cerberus*, Cuv. Règn. Anim. 2d ed. II, 1829, 81.—Dum. & Bibr. Erpét. gén. VII, II, 1854, 977.

Observ.—There is but one well-known species of this genus. Future investigations may bring to light others, either so far unobserved, or else not distinguished from the following one.

Cerberus boaeformis, Dum. & Bibr.

(Plate VIII, figs. 8–11.)

Spec. Char.—Color above deep grey or brown, with transverse black bands or bars. A black vitta upon the sides of the head and neck. Beneath yellowish, with black blotches.

Syn.—*Elaps boaeformis*, Schn. Hist. Amph. II, 1801, 301.
Hurria schneideriana, Daud. Hist. Nat. Rept. V, 1803, 281.
Python boaeformis, Merr. Tent. Syst. Amph. 1820, 89.
Cerberus obtusatus, Fitz. Neue Class. Rept. 1826, 55.
C. cinereus, Cantor, Proc. Zool. Soc. Lond. 1839, 54.
C. russelii, Fitz. Syst. Rept. I, 1843, 25.
C. boaeformis, Dum. & Bibr. Erp. gén. VII, II, 1854, 978.
Homalopsis schneiderii, Schleg. Ess. Phys. Serp. I, 1837, 171, & II, 1837, 341, Pl. XIII, figs. 6 & 7.
H. rhynchops, Cantor, Journ. Asiat. Soc. XVII, 1847, 94.

Observ.—There are many more synonymes referred to this species by systematic writers, and which we prefer leaving aside rather than adopt without criticism.

Descr.—The head is elongated, depressed, subquadrangular or subconical, bluntly truncated anteriorly, thickest posteriorly, being slightly swollen upon the temporal region. The cleft of the mouth ascends posteriorly, almost at right angles with its horizontal extension, which is nearly straight. The eyes are very small, circular, situated towards the upper surface of the head, and directed obliquely outwards and forwards; the pupil is subcircular; the orbit is composed of five plates: a supraocular, two anteorbitals, and two postorbitals. The supraoculars are the largest plates observed on the upper surface of the head; they are longer than broad, and of equal width throughout their length. The superior anteorbital is larger than the inferior one, whilst the inferior postorbital is larger than the superior one; both the inferior post- and anteorbitals meet to form the inferior rim of the orbit, thus preventing the labials from entering into it. There is a well-developed loral extending obliquely from the fourth labial to the postnasal and the frontals. The latter are four in number: two postfrontals and two prefrontals, the postfrontals being the largest, and nearly equal in size to the loral. A subquadrangular vertex plate, scarcely larger than one of the postfrontals, may be observed posterior to the latter. The nostril is small, situated between two plates on the upper surface of the snout. The prenasal is much larger than the postnasal, and nearly as large as either of the frontals, and situated altogether between the rostral and the prefrontal.

The rostral is large, pentagonal, and slightly concave upon its base; it is scarcely to be seen in an upper view of the head, its development being altogether vertical, for the snout itself is thick. The upper labials are nine or ten in number, increasing in size posteriorly; the anterior six, seven, or eight are quite narrow and elevated, whilst the posterior two, three, or four are broader, and disposed upon a double series; the posterior pair is the smallest of all. The temporal and occipital regions are covered with smooth scale-like shields. There are ten lower labials, increasing in size from the first to the seventh or eighth, and are likewise elevated and narrow; the eighth, ninth, and tenth are a little larger than the second, third, and fourth. The symphyseal has the shape of an acute triangle, and is entirely circum-

scribed by the first pair of labials, which are quite elongated, engaging between the anterior pair of mental shields, exteriorly of which is another narrow and long pair, and exteriorly and posteriorly of the latter a third and small pair. The throat is covered with irregular scales.

The body is subcylindrical and stoutish, much the thickest upon its middle. The tail is but moderately developed, subconical, and tapering, forming about the sixth of the total length.

The dorsal scales are disposed upon twenty-three or twenty-five longitudinal series; they are lanceolated and strongly carinated, except the external row on either side, which is smooth and considerably the broadest. The keels do not extend quite to the tip of the scales; the latter being rounded. Fourteen rows of scales may be observed upon the base of the tail. The abdominal scutellae are well developed, one hundred and forty-three to one hundred and forty-seven in number; the preanal one being subdivided. The subcaudal scutellae are disposed upon a double series, from fifty-two to fifty-eight in each.

The ground color above is greyish-brown, with transverse undulating black bars of the width of about one scale, leaving an intervening space of about three scales. Black irregular lines are seen upon the upper surface of the head. The snout and lips are spotted with black. There is a fronto-nasal vitta in advance of the eye. A semi-elliptic curve of black may be traced from the interocular region along the temporal region, across the eye to the sides of the neck. The two external rows of scales are generally unicolor, of a yellowish-white hue, the same which extends to the abdominal region, but the row adjoining the scutellae is occasionally covered by the black patches or maculae which are spread all over the belly, the posterior part of which, as also the subcaudal region, are nearly black.

The color of the back is occasionally of a uniform rusty color, with but one series of black spots above the lateral yellowish stripe.

Loc.—Specimens of this species were caught on Ryan's Hill, near Singapore, in 1841.

Plate VIII, fig. 8, represents *Cerberus boaeformis*, size of life.
Fig. 9, is a profile view of the head.
Fig. 10, an upper view; and,
Fig. 11, an under view of the same region.

Genus TACHYMENIS, Wiegm.

Gen. Char.—Body subcylindrical, of moderate length; tail short, subconical, tapering. Head colubrine, slightly detached from the body. Cephalic plates normal. Eyes of medium size. One or two anteorbitals and two postorbitals. One loral. Two nasals, with nostril between them. Jaws subequal. Dorsal scales smooth. Preanal scutella divided. Subcaudal scutellae disposed upon a double series.

Syn.—*Tachymenis*, Wiegm. in Nov. Act. Nat. Cur. XVII, I, 1835, 251.—Grd. in *Gilliss*, U. S. N. Astr. Exped. to S. Hemisph. II, 1855, 213.

Observ.—The genus *Tachymenis*, so far, is composed of two species, one from Peru, figured and described by Wiegmann in the work cited above, and another from Chile, described below.

Tachymenis chilensis, Grd.

Spec. Char.—Two anteorbital plates. Third and fourth labials constituting the inferior rim of the orbit. Dorsal scales disposed upon nineteen longitudinal series. Color olivaceous-brown above, with four longitudinal bands of black, sometimes interrupted along the dorsal region. Beneath yellowish, with the anterior margin of the scutellae black.

Syn.—*Coronella chilensis*, Schleg. Ess. Phys. Serp. I, 1837, 136, et II, 1837, 70. —Guich. in *Gay*, Hist. de Chile, II, 1848, 79, Pl. IV, fig. 1.

Dipsas chilensis, Dum. & Bibr. Erpét. gén. VII, II, 1854, 1159.

Tachymenis chilensis, Grd. in Proc. Acad. Nat. Sci. Philad. VII, 1854, 226; and in *Gilliss*, U. S. Astr. Exp. to S. Hemisph. II, 1855, 213, Pl. XXXVII, figs. 1–6.

Descr.—The head is subovoid, being depressed upon its upper surface; the snout is rounded, and the jaws subequal. The cleft of the mouth ascends posteriorly. The eyes, subcircular in shape, are of but moderate development, their diameter being equal to the width of the vertex plate, upon the middle of its length. The vertex plate itself is elongated, subpentagonal, diminishing gradually in width posteriorly, where it is rounded off. The occipitals are about the length of the ver-

tex plate, though a little broader anteriorly. The postfrontals are broader than long, extending somewhat to the sides of the head; they are rounded posteriorly, and truncated anteriorly. The prefrontals, smaller than the postfrontals, are subtriangular, irregularly rounded off, not reaching the nostrils. The rostral has the form of a depressed cone, concave beneath. The nostrils are rather small, situated at the junction of two subquadrangular and subequal nasal plates, the commissure of which is occasionally obliterated either above or below these apertures. The loral is quadrangular, and larger than either of the nasals. There are two subquadrangular anteorbitals, the uppermost being broader than the lower one. The postorbitals, likewise two in number, are nearly equal sized, but less regularly angular than the anteorbitals. The temporal shields are scale-like, with the exception of one or two, which are larger, elongated, and plate-like. The upper labials are seven in number; the third and fourth, narrow and elevated, constituting the inferior rim of the orbit; the fifth is the largest; the sixth is the next in size, then the fourth, the third, and the second; the seventh is a little larger than the first, which is the smallest of all. The symphyseal is triangular, moderate sized, and inclosed between the first pair of inferior labials. The latter, being nine in number, diminish in size both forwards and backwards from the fifth, which is the largest of all; the seventh, eighth, and ninth are rather narrow and elongated, whilst the anterior four are deeper than long. There are two pairs of mental shields, the posterior pair being somewhat smaller than the anterior.

The body is subcylindrical, thickest upon the middle of its length, diminishing gradually posteriorly and anteriorly, where a somewhat contracted neck separates it from the head. The tail is subconical, posteriorly pointed, rather short, and constituting about the sixth part of the entire length. The scales are smooth, disposed upon nineteen longitudinal series; they are subrhomboid, elongated on the upper region, and subtruncated laterally, largest upon the series adjoining the abdominal scutellae; they are smallest upon the nape and on the throat. The abdominal region is of a moderate width. There are one hundred and fifty-one abdominal scutellae, the preanal one being divided, and forty-three pairs of subcaudal scutellae; the latter being disposed upon a double series.

The total length of the specimen described is nineteen and a half inches; the tail measuring three and one-eighth inches.

Upon an olivaceous-brown ground, there are four longitudinal black streaks or vittae (two dorsal and two lateral), which extend from the head to the extremity of the tail. The dorsal streaks are the broadest, beginning at the posterior extremity of the occipital plates, and covering each three series of scales, or two and a half only; in the latter case, one and two adjoining half scales bear the ground color; otherwise, there is but one scale between them. The lateral streak may be traced from the posterior rim of the orbit along the fourth external series of scales, leaving two scales, bearing the ground color, between it and the dorsal streak. The anterior margin of all the scales is jet-black, but, when in their natural and imbricated state, the black does not appear externally; sometimes, the scales embraced by the dorsal streaks exhibit light margins, in which cases, those streaks will appear like a series of spots. The upper surface of the head is dotted with black. An occipito-temporal streak may be seen between the origin of the two pairs just described. There is a subocular patch, and several nasal ones. The abdominal region is yellowish, with the anterior margin of the scutellae black.

Loc.—Collected on the heights, near the sea, Valparaiso, Chile.

Genus DOLIOPHIS, Girard.

Char. gen.—*Corpore subcylindrico, longissimo; cauda modica. Capite depresso, nec a corpore discreto. Ore modico; dentibus venenatis in dua paria dispositis. Scutis cephalicis normalibus; nasalibus duobus, nare in sutura sita. Scuto loreo nullo; praeorbitali uno. Labialibus quarto et quinto in orbitam productis. Scutis postorbitalibus duobus. Squamis magnis, laevibus, lucidis, in tredecim series longitudinales dispositis. Scutella praeanali indivisa. Scutellis subcaudalibus in seriem duplicem ordinatis.*

Gen. Char.—Body subcylindrical, and very much elongated; tail moderate. Head depressed, but continuous with the body. Mouth moderate, provided anteriorly with two fangs on each side. Cephalic plates normal. Two nasals, with nostrils between them. No loral plate. One anteorbital. Third and fourth labials entering into the orbit. Two postorbitals. Scales large, smooth, shining

disposed upon thirteen longitudinal series. Preanal scutella entire; subcaudal scutellae disposed upon a double series.

Syn.—*Doliophis*, Grd. in Proc. Acad. Nat. Sci. Philad. August, 1857, 182.

Observ.—Colubrine in its general appearance, this genus resembles *Elaps* more than any other of the family to which it belongs, the system of coloration excepted, and which is rather of a uniform cast. The generic diagnosis, as given above, may undergo some modifications at the accession of other species, for, so far, we know but the one described below.

Doliophis flaviceps, Grd.

(Plate X, figs. 1–5.)

Spec. Char.—Head yellow. Middle region of back bluish-black; a pale sky-blue band on each side. Tail yellow, with its upper medial region bluish-black. Abdomen yellow, with a black band on each side.

Syn.—*Elaps flaviceps*, Cantor, in Proc. Zool. Soc. Lond. VII, 1839, 33.
Doliophis flaviceps, Grd. in Proc. Acad. Nat. Sci. Philad. August, 1857, 182.

Descr.—The head is short, subelliptical, depressed, plane above, and slightly declivous to the sides. The snout is subtruncated and rounded. The nostrils are large, and situated between two plates. The eyes, rather small, are circular; their diameter being comprised nearly three times and a half across the interocular space. The cleft of the mouth constitutes an open curve. The occipital plates are the largest of the cephalic series. The vertex plate is six-sided, subcordiform, posteriorly pointed, engaging between the occipitals. The supraoculars are rather longer than broad, and subangular. The postfrontals are much larger than the prefrontals, subangular in shape, and irregularly pentagonal; the prefrontals being subtriangular. The rostral, broad upon its base, which is concave, is subconical, being slightly visible in an upper view of the head. The prenasal is deeper than long, and larger than the postnasal, which is semi-elliptical. There is no loral plate. A large subtrapezoid anteorbital, extends from the

postnasal to the anterior rim of the orbit. The postorbitals, two in number, are subangular, deeper than broad, the lower one being the largest, and resting upon the commissure between the fourth and fifth labials. Four temporal shields may be observed; the anterior one quite large and angular. There are six upper labials, of considerable development; the first one is the smallest, triangular in shape, and situated immediately beneath the nostril; the second, third, fourth, and fifth are deeper than broad; the second corresponding to the commissure between the postnasal and the anteorbital; the third is beneath the anteorbital, forming a portion of the anterior rim of the orbit; the fourth is immediately beneath the pupil, forming the lower portion of the orbit; the fifth is under the commissure between the postorbitals and anterior temporal shield; the sixth labial is longer than broad, and the largest of the set. There are also six lower labials; the first pair is the deepest and narrowest, inclosing the small triangular symphyseal; the second is the smallest, and the fourth the largest and most dilated inferiorly; the fifth is long and narrow; the sixth, but slightly larger than the second. There are two pairs of broad and short mental shields. The region of the throat exhibits several plate-like shields.

The neck is but slightly distinct from the head. The body is very long, subcylindrical, somewhat depressed, covered with smooth scales, disposed upon thirteen longitudinal series. The latter are lanceolated, and somewhat larger upon the series next to the abdominal scutellae. The tail is rather short and subconical, provided with eight series of scales upon its base, and four only towards its apex. The abdominal scutellae are well developed, and slightly curved; the preanal one being subdivided. The subcaudal scutellae are disposed upon a double row, except the anterior three, which are entire.

The abdominal scutellae are two hundred and sixty-seven in number; the subcaudal scutellae thirty-nine. The entire length is four feet and five inches; the tail separately measuring five inches.

The upper region of the body and tail is uniform bluish-black, with a greyish or pale sky-blue streak or band along the two external series of scales. The extremities of the abdominal scutellae are black also, thus forming a black band beneath the sky-blue streak. The head and abdominal region are yellow. The tail is mostly yellowish also, since the black extends only along two series of scales of the upper region.

Loc.—A specimen of this species was collected at Singapore.

Plate X, fig. 1, represents *Doliophis flaviceps*, size of life.
Fig. 2, is a side view of the head.
Fig. 3, an upper view; and,
Fig. 4, an under view of the same region.
Fig. 5, exhibits the vent and adjoining scutellae.

Pseudelaps psammophis, Grd.

Spec. Char.—Body slender and elongated; tail tapering into a point. Scales smooth, disposed upon fifteen longitudinal series. Color bluish or greenish; unicolor above, and an obscure black band along the middle of the abdomen. A transverse black fillet upon the rostrum, and a black patch beneath the eye.

Syn.—*Elaps psammophis*, Schl. Ess. Phys. Serp. 1837, 455; &, Abbild. Amph. 1837, 137, Pl. xlvi, fig. 14.
Pseudelaps psammophidius, Dum. & Bibr. Erpét. gén. VII, ii, 1854, 1234.

Descr.—The head is slender, subovoid in general appearance, and passing gradually to the neck without any apparent contraction; its upper surface is flattened; the frontal region sloping forwards, and, since the sides are nearly vertical, it assumes an obscure subtetragonal aspect. The snout is bluntly rounded, and protrudes slightly beyond the lower jaw. The mouth is deeply cleft, and nearly rectilinear. The eye and pupil are large and subcircular. The nostril is large, and placed between two plates. The occipital plates are very large; the vertex plate is very much elongated, and sublanceolated in shape, being slightly concave laterally. The postfrontal plates are much larger than the prefrontals, extending somewhat to the sides; the prefrontals are broader than long, subtriangular or polygonal in shape. The rostral plate is pyramidal, extending somewhat to the upper surface of the head, and very concave upon its base. The prenasal is a vertically elevated plate, whilst the postnasal is horizontally elongated. There is no loral plate. The postnasal is contiguous to the anteorbital, which is well developed, subtrapezoid, oblique in position, and extending

slightly to the upper surface of the head. There are two postorbitals; the inferior one being narrower, and vertically longer than the upper, which is subquadrangular. Three or four temporal shields may be observed; the anterior two being the largest; the inferior one engaging between the fifth and sixth upper labials. The latter are six in number, all of which are well developed; the anterior two are the smallest; the first being subtriangular; the second pyramidal, with its summit slightly engaging into the commissure between the anteorbital and the postnasal; the third and fourth constitute the inferior rim of the orbit; the third being considerably elevated, and forming at the same time a portion of the anterior rim; the fifth and sixth are the largest of the series. There are seven lower labial plates; the first pair narrow and lanceolated, inclosing the symphyseal, which has the shape of an isoceles triangle; the fourth is the most developed, and the seventh the smallest of all. Two pairs of mental shields may be observed; the posterior pair being somewhat more slender and more elongated than the anterior pair. Elongated scale-like shields may be observed under the throat.

The body is slender, elongated, subcylindrical, thickest upon its middle region, covered with perfectly smooth, imbricated, and lanceolated scales, disposed upon fifteen longitudinal series. The scales increase slightly in size from the dorsal region towards the sides; they are broad and subrhomboid in the row adjoining the abdominal scutellae. The tail constitutes about the fourth of the entire length, which is twenty-five inches, six of which belonging to that organ; it is very slender and tapering, somewhat flattened beneath and convex above. Seven rows of scales may be counted upon its base.

The abdominal scutellae are well developed, one hundred and eighty-one in total number; the preanal one being subdivided. The subcaudal scutellae are all divided, and about eighty pairs in number.

The color is uniform bluish or greenish. The lower jaw, throat, and neck are yellowish. A horizontal black line extends from one nostril to the other, across the middle of the snout. A black spot, margined with yellow, extends obliquely backwards from beneath the eye to the margin of the jaw. The inferior postorbital and the inferior and inner portion of the anteorbital are yellow. Beneath lighter, with an obscure black band along the middle of the abdomen.

Loc.—A specimen of this species was collected at Sydney, Australia.

Genus PLATURUS, Latr.

Gen. Char.—Cephalic plates normal; sometimes a middle postfrontal; nasal unique. No loral. One anteorbital; two postorbitals; third and fourth labials entering into the orbit. Body subcylindrical, deeper than broad, somewhat convex on the dorsal region. Abdomen flattened; tail compressed. Dorsal scales smooth and imbricated, disposed upon twenty-three longitudinal series. Abdominal scutellae narrow and numerous; preanal one divided. Subcaudal scutellae disposed upon a double series. Coloration: black rings upon a lighter ground.

Syn.—*Platurus*, Latr. Hist. nat. Rept. IV, 1801, 197.—Daud. Hist. nat. Rept. VII, 1802, 223.—Wagl. Naturl. Syst. Amph. 1830, 166.—Dum. & Bibr. Erpét. gén. VII, II, 1854, 1318.

Observ.—The species of this genus are, strictly speaking, of marine habits; and although provided with poisonous fangs, they are inoffensive, and incapable of inflicting severe bites, owing to their small size, which does not exceed a couple of feet. Those that follow are the only ones we are so far acquainted with.

The note-book of the Expedition speaks of "the species seen on Tonga Islands as quite common, and a truly marine animal. Several were taken swimming alongside of the ship, and others on the sea-beach. Whether venomous or not, they show no disposition to bite, and are considered by the natives as perfectly harmless. Moreover, we are told of their being regarded by them as 'sacred' animals. Their motion in the water does not seem to be very rapid, and are easily captured, indeed making no attempt to escape. They appear less tenacious of life than reptiles usually are."

1. Platurus laticaudatus, Wagl.

Spec. Char.—Dorsal scales disposed upon nineteen longitudinal series. Two rows of scales along the middle region of the side of the tail. Body annulated with black; intervening spaces narrower on the

dorsal region than the rings, and broader upon the abdomen. Head black, except the fronto-rostral region, which is yellow. Middle region of throat yellow also.

Syn.—*Coluber laticaudatus*, Linn. Mus. Adolph. Fred. 1754, Tab. xvi, fig. 1.—Thunb. Acad. Ups. 1787, 11.

Hydrus fasciatus, Schn. Hist. Amph. I, 1799, 240.

Platurus fasciatus, Daud. Hist. nat. Rept. VII, 1803, 226, Pl. lxxxv.—Merr. Tent. Syst. Amph. 1820, 142.—Dum. & Bibr. Erpét. gén. VII, II, 1854, 1321.

Platurus laticaudatus, Wagl. Nat. Syst. Amph. 1830, 166.

Observ.—The synonyms not included either under this or the following species were intentionally left aside, preferring an omission to an erroneous quotation.

Descr.—The head is depressed, and but slightly broader than the neck. The snout is blunt, rounded, and nearly even with the extremity of the lower jaw. The vertex plate is subcordiform, broad, and rounded anteriorly, pointed posteriorly. The occipitals, which are well developed, are subtrapezoid, slightly rounded exteriorly, and larger than the vertex plate itself. The supraoculars are short, and irregularly rounded. The postfrontals are but very little larger than the prefrontals, which are subtriangular. The nasal plate is elongated and single, resting upon the first and second labials, and limited above by the prefrontal; sometimes, also, reaching the edge of both the third labial and postfrontal: the nostril is situated posteriorly to the middle of its length. A high and subquadrangular anteorbital may be observed situated rather obliquely upon the third labial, limited superiorly by the supraocular and the postfrontal. The eye, the pupil of which is round, is not very large, and circular in shape. There are two well-developed subangular postorbitals; the lower one somewhat larger than the upper, and situated above the commissure between the fourth and fifth labials. The temporal shields, five or six in number, are a little larger than the scales about the neck. The rostral plate is subpyramidal, with its summit contiguous to the prefrontals, thus isolating entirely the nasals. There are seven upper labials; the third and fourth are the largest, and constitute the inferior rim of the orbit; the fourth entering altogether into it, and the third only in part. The symphyseal is exceedingly small, with two small labials on either side; the remaining labials constitute two rows: an upper, in which they are

exiguous and elongated, and an inferior one, composed of the largest of the series. There are two pairs of mental shields; the anterior pair quadrangularly elongated, and the posterior pair spear-shaped; both contiguous upon their inner margin. The middle region of the throat is occupied by three quite large scales.

The scales are smooth and shining, disposed upon nineteen longitudinal series. They are well-developed, subrhomboid, and nearly equal sized all around the body. There are two hundred and twenty-eight, rather narrow but transversely well-developed, abdominal scutellae; the posterior two being divided. The tail, which constitutes the tenth or eleventh of the entire length, is quite thin, spatuliform, and rounded upon its posterior margin. There are ten subdivided subcaudal scutellae, properly so to be called, followed by twenty-four others along the edge on either side. The upper edge exhibits a similar series of transversely elongated scutellae. The intervening and middle region is occupied by two longitudinal series of scale-like scutellae, transversely dilated. The posterior edge of the tail is formed by one single sharp plate.

The head is black, except the fronto-nasal region, from the rostral plate to the anterior margin of the vertex plate, embracing entirely the frontal plates, the portion of the nasal in advance of the nostril, the upper half of the anteorbital, most of the supraocular, the external angle of the occipital, the upper and part of the lower postorbital, and one or two temporal shields, which are yellowish. A space along the middle region of the throat, embracing half of the mental shields, to the neck, is likewise yellowish. The latter area unites with a light ring around the neck. The body is annulated with rings of a jet shining black above, and brownish-black beneath, forty-one in number from the occiput to the tip of the tail; these rings are much broader along the dorsal region than on the abdomen, where they cover from two and a half to three and a half scutellae. The intervening space is bluish above, and considerably narrower than the black rings themselves, whilst beneath they assume a yellowish-white hue, and nearly equal to the rings in width. The tail is similarly annulated; the rings maintaining their width from the upper to the lower edge, the black being wider than the yellow. The terminal edge is yellow.

Loc.—A specimen of this species is from the Feejee Islands.

2. Platurus colubrinus, Wagl.

Spec. Char.—Dorsal scales disposed upon twenty-three longitudinal series. Three rows of scales along the middle region of the side of the tail. Body annulated with black; intervening spaces equal in width to the rings on the dorsal region, and much broader upon the abdomen. Fronto-rostral and supraocular regions yellow. Upper labials, part of lower labials, and middle region of the throat yellow also.

Syn.—*Hydrus colubrinus*, Schn. Hist. Amph. I, 1799, 238.
Platurus colubrinus, Wagl. Nat. Syst. Amph. 1830, 166.
Hydrophis colubrinus, Schl. in Faun. Japon. 1833, Pl. x; & Ess. Phys. Serp. II, 1837, 514, Pl. xviii, figs. 18–22.—Duvern. in *Cuv.* Règn. Anim. Illustr. 1846, 130, Pl. xxxvi.

Descr.—The general aspect of this species is very similar to the preceding one, from which it is not regarded as distinct by several writers. There are but minor differences to be noticed in the structure of the cephalic plates: the vertex plate is larger and more elongated; the postfrontals larger than the prefrontals, all of which being irregular in their outline. An odd frontal may likewise be observed either upon the line of contact of both pairs, or else extending to the vertex plate, between the postfrontals. There are three lower labials in one series upon each side of the symphyseal. The mental shields are nearly equal sized, but, in the anterior pair, they are quadrangular, whilst the posterior are tapering posteriorly. In either species, we observe nine scales, in a longitudinal series between the mental shields and the first abdominal scutella.

The scales are smaller than in *P. laticaudatus*, lozenge-shaped, and disposed upon twenty-three longitudinal series, nearly uniform in size. In both species, the body is convex above and flat beneath. There are two hundred and thirty-two abdominal scutellae; the posterior two being subdivided. The tail and subcaudal scutellae present the same structure as in *P. laticaudatus*, with this difference, that there are three longitudinal series of scale-like scutellae along the lateral middle region of that organ.

The fronto-nasal and the supraocular regions, and the edge of the snout are yellow, thus leaving but a narrow black bar behind the eye,

uniting with the occipital patch, which passes downwards behind the angle of the mouth, hence extending forwards along the lower jaw, and backwards to the adjacent black patch, which does not form a complete ring around the neck. There are from thirty-two to thirty-three jet black rings, from the occiput to the tip of the tail, to which four of these rings belong. Along the dorsal region they are equal in width to the intervening spaces, whilst along the sides, the latter widen at the same time as the rings become narrower, and along the abdomen, for every two black scutellae there are five intervening white ones. On the lower half of the sides and the abdomen, the spaces between the black rings are yellowish or whitish. On the dorsal region, the tip of each scale is yellowish, whilst its base is dark greyish. The posterior margin of the tail is yellow.

Loc.—Specimens were collected at the Feejee and Tonga Islands, where they are said to be "very common."

Genus PELAMYS, Daud.

Gen. Char.—Two pairs of frontal plates. No nasals. Nostril in the prefrontal. No loral. One anteorbital; two postorbitals; one infraorbital; labials not entering into the orbit. Gape of mouth ascending posteriorly. Body compressed, much deeper than broad. Back thickish, convex. Abdomen narrow. Tail very much compressed. Scales small, smooth, hexagonal, pavement-like, subequal. Abdomen and tail covered with scales like those of the back: hence neither abdominal nor subcaudal scutellae. Colors: uniform; tail occasionally blotched.

Syn.—*Pelamys*, Daud. Hist. nat. Rept. VII, 1802, 357.—Wagl. Naturl. Syst. Amph. 1830, 166.—Gray, Catal. Snakes Brit. Mus. 1849, 41.—Dum. & Bibr. Erpét. gén. VII, II, 1854, 1333.

Thalassophis, Schmidt, Abhandl. Naturw. Ver. Hamb. II, 1852.

Observ.—Here is another genus of marine snakes, including so far the single species whose description follows. Like those of the preceding genus, it never reaches to any size that could for a moment give origin to the mythic stories about such a "sea serpent" as we hear

now and then spoken of in the periodical literature. Comparatively small and inoffensive, though likewise possessed with poisonous fangs, it might however bite with more severity, having a larger mouth and stronger jaws. In its external aspect, it is more eel-like than the species of *Platurus*, which, were it not for their compressed tail, would otherwise bear the physiognomy of the terrestrial tribe of *Elapsidae*.

PELAMYS BICOLOR, Daud.

SPEC. CHAR.—Body very much compressed; tail very thin, and obtuse posteriorly. Above uniform black; beneath uniform yellow or white. Black patches upon the tail.

SYN.—*Anguis platuros*, GM. *Linn.* Syst. Nat. Ed. xiii^{a}, III, I, 1788, 1122.

Hydrus bicolor, SCHN. Hist. Amph. I, 1799, 242.—SHAW, Gen. Zool. III, 1802, Pl. CXXV & CXXVI.

Hydrophis platura, LATR. Hist. nat. Rept. IV, 1801, 197.

Pelamys bicolor (Pelamide bicolore), DAUD. Hist. nat. Rept. VII, 1802, 366, Pl. LXXXIX.—CUV. Règn. Anim. Illustr. 1846, 134, Pl. XXXVI bis, fig. 1.—GRAY, Catal. Snakes Brit. Mus. 1849, 41.—DUM. & BIBR. Erpét. gén. VII, II, 1854, 1335.

Hydrophis pelamys, SCHL. Phys. Serp. II, 1837, 508, Pl. XVIII, figs. 13, 14, & 15.

Hydrus, CANTOR, Catal. of Snakes Malay. Penins. 1847, 135.

Thalassophis schlegelii, SCHMIDT, Abhandl. Naturw. Ver. Hamb. II, 1852, Tab. V.

Nalla Wahlagillee pam, RUSSELL, Ind. Serp. I, 1796, Pl. XLI.

Schiddil, ibid. II, 1796, Pl. XII.

DESCR.—The head is very much depressed, anteriorly narrow, and considerably swollen at the occipital region. The gape of the mouth is very deep, ascending obliquely upwards posteriorly. The occipital plates are the largest of the cephalic series; they are much longer than broad, and more or less polygonal. The vertex plate is subhexagonal, obtuse-angled anteriorly, with the sides nearly parallel, until it terminates into an acute triangle. The supraoculars are well-developed, nearly as broad as the vertex plate, but not quite as long. The postfrontals are irregularly quadrangular, and smaller than the prefrontals, which are elongated, tapering anteriorly bearing the nostrils upon the middle of their posterior portion; the nasals are, therefore, absent, and the nostrils, by this arrangement, belong entirely to the upper surface of the head. The rostral is pentagonal and depressed. The first and second upper labials extend over the space which elsewhere is occupied by the nasal and loral plates. There is one anteorbital,

somewhat spear-shaped, with the base towards the eye, and contiguous anteriorly to the postfrontal, second and third upper labials. An inferior orbital, subcrescentic in shape and concave upwards, constitutes the inferior rim of the orbit. It is contiguous above to the anteorbital, in front with the third labial, beneath with the fourth and fifth labials, and posteriorly with the lower postorbital and a temporal shield. Two postorbitals, nearly equal sized, complete the orbit posteriorly; sometimes, three postorbitals may be observed, in which case, the third is a mere subdivision of the inferior orbital. Both the temporal and occipital regions are covered with comparatively large, polygonal, scale-like shields or plates. The upper labials are eight in number; the second is conspicuously the largest, and the first nearly equal to the third; the fourth, fifth, and sixth, are smaller still; the seventh and eighth, the smallest of the series, occupy the upper and oblique branch of the gape of the mouth. The lower labials may be numbered twelve; the posterior four are scale-like, occupying the oblique ascending branch of the gape of the mouth; the sixth, seventh, and eighth, are quite inconspicuous and small; the first, fourth, and fifth, are the largest; the second and third being somewhat smaller. The labials of the first pair are contiguous posteriorly, inclosing a very small symphyseal. There is only one pair of well-developed, irregularly rounded, mental shields; the remaining portion of the inferior surface of the head being covered with elongated scales, somewhat larger than the scales of the body.

The body is stoutest upon its middle region; it is compressed, rather rounded upon the anterior third of the dorsal region, whilst it is thinning off posteriorly and beneath, so as to present a rather conspicuous dorsal ridge, and a sharp belly. The scales, which extend to the abdomen, as well as to the back and sides, and thus suppressing entirely the abdominal scutellae,—are very uniform in size, small, subhexagonal, and smooth, mayhap a little larger above and beneath than on the middle of the sides. They constitute longitudinal series: sixty-two in number across the line of greatest depth of the body, and fifty-four around the neck. Four pairs of small plates may be observed about the preanal region. The tail is small, forming the eighth or ninth of the entire length, very much compressed, very thin and obtuse posteriorly. The scales upon the latter region are larger than on the body, but do not constitute longitudinal series.

The upper surface of head, and the dorsal region to the middle of

the flanks is uniform black; from the middle of the flanks downwards, the general hue is uniform yellow. The tail is straw-colored, spotted with black. A series of these spots, saddle-like, may be traced all along the upper edge of that organ, and a similar series also along the inferior edge, whilst the middle region exhibits several rounded ones, constitutiug another series.

Loc.—A specimen of this species was collected at Pomotu, or Society Islands.

Genus CROTALUS, Linn.

Gen. Char.—Upper surface of the head covered with small, scale-like plates, the anterior ones largest. Temporal shields and labial plates small and convex. A deep pit between the eye and the nostril. Dorsal scales keeled. Preanal and subcaudal scutellae entire. Tail terminated by a well-developed rattle.

Syn.—*Crotalus*, Linn. Syst. Nat. I, 1766, 370.—Gray, Catal. Snakes Brit. Mus. 1849, 19.—B. & G. Catal. N. Amer. Rept. I, 1853, i.—Dum. & Bibr. Erpét. gén. VII, II, 1854, 1453.

Observ.—The rattlesnakes, it is well known, are provided with one, two, or more hollow fangs on either side of the roof of the mouth, and in communication with a poison-bag lodged within the thickness of the bone itself.

Crotalus lucifer, B. & G.

(Plate XV, figs. 1–6.)

Char. spec.—*Squamis dorsualibus in quinque et viginti series longitudinales dispositis; extrema laevi, secunda et tertia obsolete carinatis. Cauda et posteriore corporis parte sexdecim vel septendecim nigris semi-annulis fasciatis. Series sexangularum vel octangularum fuscarum macularum, angustâ et pallidâ lineâ circumdatarum, in dorso est sita. Fasciola clara ex supraoculari scuto transit per oris angulum, insuper tertiam et quartam squamarum supralabialium seriem.*

SPEC. CHAR.—Dorsal rows of scales, twenty-five; exterior one smooth; second and third, obsoletely carinated. Tail, and posterior portion of body, with sixteen or seventeen black half-rings. A series of brown dorsal hexagons or octogons, separated throughout by a narrow light line. A light stripe from the supraocular crosses the angle of the mouth on the third and fourth series of supralabials.

SYN.—*Crotalus lucifer*, B. & G. in Proc. Acad. Nat. Sc. Philad. VI, 1852, 177.—B. & G. Catal. of N. Amer. Rept. I, 1853, 6.

DESCR.—The head is very broad anteriorly, its outline being but slightly tapering forwards in an upper view. Its upper surface is covered with many small and tuberculiform scales, exhibiting a substellated aspect. The interval between the supraocular plates is filled with small scales, nearly equal sized, except upon the row adjoining these plates, in which they are very small. The scales upon the frontal region, in advance of the supraoculars, are variable in number, size, and shape; in one specimen, there are two rows of four each, of considerable size; in another, they are fewer, larger, and more irregular. The rostral plate is high, subconical, or subpentagonal. The prenasal is subangular, larger than the postnasal, in the anterior edge of which the nostril opens. The prenasal is contiguous to the rostral and anterior upper labial. The eye is proportionally small, and protected superiorly by a large and oblong plate, the supraocular, the edge of which is slightly thickened. Immediately in advance of the eye, there is an elongated subquadrangular loral (or anteorbital), separated anteriorly from the postnasal by two small scale-like plates. Beneath it we observe a smaller and subtriangular plate, limiting the upper edge of the facial pit, the lower edge of which pit is bordered by very small plates. The temporal shields are large, flat, and smooth. There are fourteen upper labial plates on either side, resembling in shape and structure the temporal shields. The lower labials are sixteen in number on either side, also; the posterior twelve are slightly higher than long, contrasting somewhat with the scales immediately beneath. The symphyseal is triangular and conspicuous; the adjoining first labial is the most elongated of all, and meets its fellow under the chin, thus completely inclosing the symphyseal. The second, third, and fourth labials are larger than the rest. There is but one pair of mental shields, very large, and suboblong. The scales on the throat are elongated, subelliptical, and smooth.

The dorsal scales are disposed upon twenty-five longitudinal series, narrowest on the back, tapering and rounded posteriorly, provided with a strong keel. Towards the sides the scales slightly increase in size, whilst their keel becomes obsolete till it almost entirely disappears upon the external two series, which are, at the same time, the broadest. The abdominal scutellae are rather narrow, about one hundred and sixty-six in number. The preanal one is entire, as well as the subcaudal scutellae, which number from twenty to twenty-five. The rattle is composed of six rings and a half.

The total length of the largest specimen described is twenty-seven and three-fourths inches, of which three and three-fourths inches belong to the tail.

The ground color is light above. Along the back there is a series of subhexagonal or octogonal blotches, formed by a skeleton of a dull yellow, constituting a dorsal chain. The space of the ground color thus inclosed is faintly margined with dark brown; the width of the interval between the successive blotches is from one half to one and a half scales. These spots are frequently confluent, two and three running together. Where most distinct, the spots are four scales long and eleven wide. On each side of this dorsal series is a second, separated by a single row of scales; the blotches extending from the abdominal scutellae to the fifth or sixth row. These are smaller than the dorsal and subcircular. Opposite the transverse light bands, and in the open space between four contiguous blotches on the sides, smaller blotches may be indistinctly observed. Posteriorly, the spots on the back and sides are confluent and darker; in one specimen forming seventeen half-rings, encircling the upper region, leaving about twenty-four dorsal blotches. The abdomen is greenish-yellow, more or less clouded with brown at the bases of the scales. The head is dark brown; a light line extends from the posterior portion of the supraoculars along the fourth row of supralabial scales to the angle of the mouth. The same light color is observed upon the upper labials, and whole front and side, leaving only the top of the head dark. The space about the facial pit is darker.

The theory of coloration is that of decussating lines, which, when they intersect, unite so as to have the angles of intersection truncated.

The species has a general resemblance to *C. atrox* in the arrangement of the blotches, but it is darker, and has about seventeen dark half-rings posteriorly, instead of four or five. In *C. atrox* the head is narrower

and more triangular; the space between the supraciliaries narrow, and occupied by large angular scales, instead of small tuberculous ones. In *C. atrox*, the row bordering the supraciliaries is much larger than the rest, and the scales on the top of the head generally more angular. In *C. lucifer*, the line on the side of the head, instead of going directly from the posterior end of the supraciliary to the commissures, passes backwards nearly parallel to the mouth, crossing along the fourth row of supralabial plates. The second line in front of the eye is much wider below in *C. lucifer*, and the face generally shows more of white, while the dark portions are much darker.

Loc.—This species inhabits the western coast of the United States; specimens having been collected both in California and Oregon.

Plate XV, fig. 1, represents *Crotalus lucifer*, size of life.
Fig. 2, is a side view of the head.
Fig. 3, an upper view; and,
Fig. 4, an under view of the same region.
Fig. 5, is a front view of the head.
Fig. 6, exhibits the dorsal scales.

SAURIA.

1856 & 1857.

Ordo III. SAURIA.

The order of Saurians is composed of reptiles more diversified in their external appearance than that of the Ophidians, which we have just passed in review; even more diversified than the Batrachians, which were introduced at the head of this report.

In all the Saurians the body is generally elongated and rounded, to a few exceptions; its surface is covered with scales or modifications of scales, which are subjected to a great diversity of forms and aspects, from true imbricated scales down to minute granules. The eye is provided, in the majority of cases, with distinct eyelids. The auricular aperture, likewise, is visible externally in most of them, so as to expose the tympanum or drum. The mouth is not dilatable, as in the Ophidians; the jaws being toothed, and the palate occasionally also, though we never observe any fangs or venom in the whole order of Saurians. Some of them are, however, considered as highly venemous, and hence dangerous, by the natives of various regions of the globe: a prejudice which is difficult to eradicate from their mind. Indeed, such saurians as are truly dangerous to men, become such by their large size and strength, and those who are familiar with the alligators and crocodiles will readily understand our meaning. The limbs are generally four in number; sometimes two only being observed, sometimes in a rudimentary state, so as to be hidden under the skin, appearing completely deprived of them. The tail is elongated, tapering, seldom prehensile, covered with scales mostly disposed upon verticils; the cloaca, situated at the base of that organ is generally transverse.

Upon the skeleton we observe distinct and moveable ribs, also a sternum, which Ophidians have not. The external envelope of the eggs consists in a tough or hard membrane; the young undergoing no metamorphosis.

Fam. VARANIDAE.

Some of the species of this family attain a considerable size, being, next to the crocodiles, the largest of the order of Saurians.

The general aspect of their body is elongated, rounded, and without dorsal crest. The legs, four in number, are stoutish; the toes being compressed or rounded, five in number, unequal, variable in length according to the genera, and terminated by nails generally powerful. The tail is somewhat compressed, hardly ever perfectly round, and much longer than the body and head together; oftentimes, provided above with a keel formed by a double series of elevated scales.

The head is separated from the body by a quite distinct neck. It is covered above with small polygonal plates, flattened, if not entirely smooth. The tongue is fleshy, elongated, slender, flattened upon its base, deeply bifurcated anteriorly; the points diverging, and the whole retractile into a sheath pretty much in the same manner as in the serpents. The palate is always toothless. The maxillary teeth, the root of which is flattened, are disposed upon one single row, and inserted upon the inside of the jaws in a kind of groove, wanting of its inner edge, and constituting, as it were, a common socket or alveola for all the teeth belonging to one jawbone. The crown of these teeth is generally pointed or conical, and inclined backwards.

The scales are placed side by side, unimbricated. On the back and sides they are subtuberculous or rounded; the centre being more elevated than the disk, each of which being occasionally surrounded by an annular series of small granules of great regularity and elegance. They are disposed upon transverse or cross series, and sometimes upon longitudinal series also. Beneath, we observe smooth and regular small plates variously disposed according to the regions. There are no femoral pores. On the tail, the scales are arranged in transverse or annular series, preserving the same general character as those of the back and belly, being a good deal larger and plate-like upon its inferior surface.

The food of the ordinary varanids consists in large insects; the more bulky species attacking likewise the small quadrupeds, the birds, reptiles of other families, and fishes.

There are, in this family, species which inhabit sandy and barren districts away from the water, and others that frequent the margin of

rivers and lakes, leading a subaquatic life. It is a generally received opinion, that they keep pretty much on the surface of the ground, seldom, if ever, venturing to climb on trees or rocks. In the journal kept on board the squadron by the naturalists of the Expedition, we find the following observation on the habits of an Australian species, which will be read with interest: "This large reptile (three to four feet in length), appears to be by no means rare. One seen at Pewen Bewen, by Mr. Dana and myself, immediately mounted a tree rather leisurely and with measured pace, and ascended to one of the topmost branches, where it fixed itself, without regarding any further attempt to dislodge it, and, indeed, from the height and scarcity of suitable missiles, it was more secure than would appear at first. This, we were informed, is its usual custom." [Pickering.]

Syn.—*Varanidae*, Bonap. Saggio, Distr. Anim. Vertebr. 1831.
Varaniens, Dum. & Bibr. Erpét. gén. III, 1836, 437.—Dum. & A. Dum. Catal. méth. Rept. Mus. d'hist. nat. 1851, 49.
Monitoridae, Gray, Ann. Nat. Hist. I, 1838; & Catal. Lizz. Brit. Mus. 1845, 6.

Most of the living representatives of this family inhabit the Old World, with the exception of the heloderms, which are Americans. Many species, some of huge dimensions, have left their remains in the solid strata of the globe in both hemispheres.

Genus HYDROSAURUS, Wagl.

Gen. Char.—Body covered with small scales. Head elongated, subpyramidal. Teeth compressed, sharp-edged, denticulated. Nostrils oblong, longitudinal, near the apex of the muzzle. Tail very long, provided above with a double-edged keel. Toes unequal, elongated, and compressed.

Syn.—*Hydrosaurus*, Wagl. Naturl. Syst. Amph. 1830, 164.—Gray, Catal. Lizz. Brit. Mus. 1845, 6 & 12.

Observ.—Wagler was led into error as to the disposition of the dorsal scales, which are placed side by side, surrounded with small granules, instead of being imbricated and deprived of these same

granules: an error which Duméril & Bibron, "Erpétologie générale, III, 1836, 493," have already pointed out.

Hydrosaurus varius, Gray.

Spec. Char.—Supraocular plates small, equal. Dorsal scales very small. Tail longer than the body and head together, tapering into a point. A fold under the throat. Color variable, variegated with black and yellow. Neck with lunate black bands. Inferior surface of head and throat transversely banded with black.

Syn.—*Lacerta varia*, Shaw, in *White's* Journ. Voy. N. S. Wales, 1790, 246, Pl. III, fig. 2; Nat. Misc. III, 1792, 83; &, Gen. Zool. III, 1802, 215.

Tupinambis variegatus, Daud. Hist. nat. Rept. III, 1803, 76.—Kuhl, Act. Acad. Nat. Cur. XI, 1820, 125.

Varanus varius, Merr. Tent. Syst. Amph. 1820, 58.—Gray, in *King's* Voy. to Austr. II, 1827, 427.—Dum. & Bibr. Erpét. gén. III, 1836, 491.—Dum. & A. Dum. Catal. méth. Rept. Mus. d'Hist. nat. 1851, 51.

Hydrosaurus variegatus, Wagl. Naturl. Syst. Amph. 1830, 164.

Hydrosaurus varius, Gray, Ann. Nat. Hist. I, 1838, 394; &, Catal. Lizz. Brit. Mus. 1845, 12.

Monitor varius, Gray, Synops. Rept. in *Griff.* Anim. Kingd. IX, 1831, 25.

Observ.—This species has been tolerably well described by the authors just quoted, so that we might almost limit ourselves to alluding to the coloration of the specimen, a prepared skin, which lies before us, since it is apt to vary within considerable limits.

Descr.—The length of the body and head together is about two feet; the tail is still longer. The head is subquadrangular or subpyramidal, elongated, and of rather slender appearance. The neck and body are subcylindrical. The tail itself is subcircular upon its base, and, for a short distance, keelless. The double-edged keel, however, gradually makes its appearance, and may be followed down to its very tip, which is pointed, the organ, at first somewhat compressed, where the carination began, having gradually tapered away, to assume almost a triangular shape, upon the latter third or fourth of its length.

The scales are disposed upon transverse series; they are smaller upon the back and sides than upon the abdomen, and larger along the tail than on the body, the same disproportions being observed between

those of the upper and inferior surfaces. Along the upper surface of the neck they are larger than on the back and tail, whilst they are a good deal smaller on the sides and inferior surface of the same region than on the sides of the body and on the abdomen. The scales are quite small upon the pectoral fold.

The black and yellow are the only two colors observed. Upon the upper surface and sides of the head the black predominates as ground color, over which are six interrupted and transverse yellow bars: two across the fronto-nasal region, two upon the interocular space, and two on the occiput. Upon the neck and shoulders the yellow appears as ground color, and the black constitutes narrow, black, and lunate bands, convex backwards, stretching obliquely forwards and downwards on the sides. The intervening space between these black bands is spotted with black, and along the middle region of the neck the black spots occupy as much ground as the yellow itself. The upper surface of the body and limbs is black, with semi-annular bands of yellow spots and dots. Beneath, the predominating hue is the yellow. Six or seven jet black transverse bands may be observed from the extremity of the lower jaw to the pectoral fold, and two narrower, though longer ones, across the chest. Along the abdomen they are proportionally more numerous and less regular, though nearly equal to the yellow intervals, and under the legs they are undulated or waving, and narrower compared to the yellow intervals. The yellow intervals under the abdomen are spotted with black, and the black bands spotted with yellow. The tail is similarly annulated and spotted.

Loc.—Near Sydney, New South Wales, Australia.

Fam. LACERTIDAE.

According to recent writers on herpetology, the Saurian family here referred to may be characterized by a quite elongated and rounded, neither depressed nor compressed, body; the tail being especially elongated, reaching, in some species, a length four times that of the body itself. Four strongly developed limbs, provided with four or five fingers and five toes, rounded, or slightly compressed, slender, conical, unequal,

all terminated by curved nails. The head, which has the shape of a quadrangular pyramid, is flattened, tapering forwards, covered with horny, polygonal, and symmetrical plates. The tympanum is visible, and placed either evenly with the surface of the head, else slightly within the edge of the auricular aperture. The eyes, in most instances, are provided with three movable lids. The mouth is deeply cleft, with the labial plates and inframaxillary shields considerably developed. The teeth are unequal in size and shape, inserted upon the inner edge of a common groove, situated along the exposed portion of the maxillary bones, the palatine teeth being either wanting or present, and, in the latter case, varying in position. The tongue is free, fleshy, flattened, thin, more or less protractile; its base being occasionally surrounded by a sheath; its surface covered with scale-like, rounded, or angular papillae; its extremity always emarginated or bifurcated, subdivided into two equal parts. The tail is conical, very long, generally rounded upon its whole extent, and protected by verticillated scales. The skin is covered with scales varying in size, granular or rhomboid, and keeled on the dorsal region, which is never crested. The neck exhibits, in most instances, one or several cross-folds, covered with tubercles, granulations, or large scales, varying in shape, constituting a kind of necklace. The abdomen is protected with scutellae, always larger than the dorsal scales; they are either rectangular or rounded. In most cases, pores may be observed along the thighs or upon the interfemoral region.

Syn.—*Lacertiens*, Cuv. Règn. Anim. II, 1817.—Dum. & Bibr. Erpét. gén. V, 1839, 1.
Lacertae, Wiegm. Herp. Méx. I, 1834, 9.
Lacertidae, Bonap. Saggio, Distr. Anim. Verteb. 1831.
Autosaures, Dum. & Bibr. Erpét. gén. V, 1839, 1.

It has been observed that in some Lacertians the root of the teeth is hollow, whilst in others the teeth are compact throughout. This fact has led some authors to consider each of these groups as constituting a separate family, whilst others have looked upon them as indicating a subdivision of a rather minor degree.

Of each of these two subdivisions, the collection made by the Exploring Expedition contains but one species, which we will introduce to the reader under their special headings.

Subfam. COELODONTES.

The teeth are hollow, especially at their base and root, hence easily detached from the jaws. All the genera of this group belong to the Eastern World, Australasia included.

Syn.—*Coelodontes*, Dum. & Bibr. Erpét. gén. V, 1839, 17 & 153.
Lacertinidae, Gray, Ann. Nat. Hist. I, 1838, 279; &, Catal. Lizz. Brit. Mus. 1845, 26.

Observ.—The "Autosaures coelodontes" are furthermore subdivided into "Pristidactyles," which have carinated and serrated fingers; and into "Leiodactyles," whose fingers and toes are smooth. The species recorded further on belongs to the latter subdivision.

Genus LACERTA, Linn.

Gen. Char.—Tongue not sheathed at the base, moderately elongated, bifid at the extremity, covered with imbricated, scale-like papillae. Palate either toothless or provided with teeth. Premaxillary teeth conical; maxillary teeth somewhat compressed and straight; the anterior ones simple; the following obtusely tricuspid. Lower eyelid opaque, covered with scales. Nostrils lateral, in the lower hinder angle of a prenasal, with two small superposed postnasals. Tympanum situated below the surface of the auricular aperture. Temple with polygonal, unequal, small plates. A narrow cross-fold under the ear, and a necklace of scales. Dorsal scales ovate, granular, thick, convex, not imbricated. Abdominal scutellae square; the two central series narrower. Preanal shield single, surrounded by smaller ones. Femoral pores present. Anterior limbs provided with five slightly compressed fingers. Tail conical or cyclotetragonal.

Syn.—*Lacerta*, Linn. Syst. Nat. ed. VI, 1748.—Merr. Tent. Syst. Amph. 1820, 62.—Wagl. Naturl. Syst. Amph. 1830, 154.—Wiegm. Herp. Mex. I, 1834, 9.—Dum. & Bibr. Erpét. gén. V, 1839, 174.—Gray, Catal. Lizz. Brit. Mus. 1845, 30.

Observ.—We think the genus *Lacerta* ought to be restricted within narrower limits than those ascribed to it by Duméril and Bibron, with-

out seeing, however, the necessity of subdividing it according to the method of John Edward Gray, for we perceive no material difference between his diagnoses of *Lacerta* and *Teira*, except in the number of the rows of abdominal scutellae, which, so far, is but a relative and not an absolute character. As to the palatine teeth, we are not informed as to whether their presence or absence can be of any assistance in the classification of the present group.

LACERTA MADERENSIS, Fitz.

(Plate XXIV, figs. 1–8.)

SPEC. CHAR.—No palatine teeth. Abdominal scutellae six-rowed. Necklace composed of eleven or thirteen smooth scales, with even edge. Temporal scales smooth. Caudal scales obscurely keeled anteriorly, more conspicuously so posteriorly. About twenty pores under each thigh, constituting a very close series, interrupted upon the interfemoral region.

SYN.—*Lacerta maderensis*, FITZ. Neue Class. Rept. 1826, 51.

Lacerta dugesii, MILN. EDW. Ann. Sc. Nat. XVI, 1829, 84, Pl. VI, fig. 2.—DUM. & BIBR. Erpét. gén. V, 1839, 236.

Teira punctata, GRAY, Ann. Nat. Hist. I, 1838, 286; &, Catal. Lizz. Brit. Mus. 1845, 33.

OBSERV.—We have a complete series of specimens of various ages before us, all agreeing well in their structure. The color is liable to some variations, the extremes of which are observed in the very young and the old; it is more or less faded in the specimens preserved in alcohol. Judging of it from a colored sketch made from life in September, 1838, the middle region of the back is dark greenish-brown, densely spotted with black. A narrow reddish-brown vitta separates the dorsal from the lateral region, which is very dark, almost black, speckled with white. The upper surface of the head, limbs, and tail is olivaceous-brown, also spotted with black, and speckled with white. The inferior regions are of a uniform greenish hue, with occasional black dots under the chin and thighs.

LOC.—Island of Madeira, where it is reported to be common.

Plate XXIV, fig. 1, represents *Lacerta maderensis*, size of life.
Fig. 2, is a view of the upper surface of the head;
Fig. 3, a profile of the same; and,
Fig. 4, a view from beneath.
Fig. 5, exhibits the left hand from above;
Fig. 6, the same hand from beneath.
Fig. 7, is a group of dorsal scales.
Fig. 8, is intended to show the abdominal scutellae.
Figs. 2–8 are somewhat magnified.

Subfam. PLEODONTES.

The teeth are compact throughout, and firmly adhering to the jaw bones. All the representatives of this group belong to the New, or Western World.

Syn.—*Pléodontes*, Dum. & Bibr. Erpét. gén. V, 1839, 16 & 40.
Teidae, Gray, Ann. Nat. Hist. I, 1838, 276; &, Catal. Lizz. Brit. Mus. 1845, 14.

Observ.—The "Autosaures pléodontes," subdivided into "Compressicaudes," which have a compressed tail, crested above; and "Strongylures," whose tail is rounded, conical, or better cyclotetragonal. The species recorded below belongs to the latter subdivision.

Genus TEIUS, Merr.

Gen. Char.—Tongue long and protractile, sheathing at the base, covered with rhomboid papillae, subdivided upon its extremity into two slender, smooth threads. No palatine teeth. Premaxillary teeth slightly flattened, exhibiting two or three notches at their summit. Anterior maxillary teeth hooked; the rest being erect, compressed, tricuspid in the young, and tuberculous in the old. Nostrils lateral, situated between two plates, and approximating closely the first labial. Eyelids extant. Tympanum near the external edge of the auricular aperture. Two or three cross-folds under the neck. Back covered with small, angular, not imbricated, scales, disposed upon transverse series. Abdominal scutellae flat, smooth, quadrilateral,

oblong, alternating. Femoral pores present. Five fingers and five toes, unequal, compressed, not carinated above. Tail cyclotetragonal, somewhat compressed posteriorly.

Syn.—*Tejus*, Merr. Tent. Syst. Amph. 1820, 60.—Gray, Catal. Lizz. Brit. Mus. 1845, 16.

Monitor, Cuv. Règn. Anim. II, 1817, 27 ; &, 2d ed. II, 1829, 28.

Podinema, Wagl. Naturl. Syst. Amph. 1830, 153.—Wiegm. Herp. Mex. 1834, 8.

Ctenodon, Wagl. Naturl. Syst. Amph. 1830, 153.—Wiegm. Herp. Mex. 1834, 8.

Exypneustes, Kaup, in *Oken's* Isis, 1826, 87.—Wiegm. Herp. Mex. 1834, 8.

Salvator, Dum. & Bibr. Erpét. gén. V, 1839, 78.

Observ.—We agree with Gray in restoring the genus *Teius*, of Merrem, although the species we refer to it here, is not placed the first on the list by the author just mentioned. The name of *Monitor* is very objectionable, it having been applied indiscriminately to species belonging to the Varanid family as well as to Lacertians. That of *Salvator* might have been adopted with great propriety, had there not been another claiming priority.

Teius teguixin, Schinz.

(Plate XVIII, figs. 1–7.)

Spec. Char.—Two large plates upon the loral (phrenic) region, immediately behind the postnasal. Upper portion of the temporal region exhibiting five or six shields of moderate size. Ground color of upper regions black, with yellow spots variously disposed; inferior regions yellowish, maculated with black.

Syn.—*Le sauvegarde*, Merian, De Metamorph. Insect. Surinam. 1705, Tab. lxx.

Amphibium, Merian, De Metamorph. Insect. Surinam. 1705, Tab. iv (jun.).

Lacerta tecuixin minor seu teiuguacu, Novae Hispaniae, Seba, Thes. Nat. I, 1734, 150, Tab. xcvi, fig. 1 (jun.).

Lacerta cuetzpallin dicta, innocua elegantissima, Seba, Thes. Nat. I, 1734, 153, Tab. xcvii, fig. 5 (jun.).

Lacerta tejuguacu americana maxima, sauvegarde dicta, marmoreis coloris amphibia, Seba, Thes. Nat. I, 1734, 54, Tab. xcix, fig. 1.

Lacerta cauda tereti corpore duplo longiore, &c., Hast. in Amaen. Acad. I, 1749, 128.

Lacertus tejuguacu americana maxima, sauvegarde dicta, Klein, Quadr. Disp. 1751, 102.

Lacerta teguixin, Linn. Mus. Adolph. Freder. 1754, 45; Syst. Nat. edit. X[a], 1760, 208; &, edit. XII[a], 1768, 368.—Gmel. *Linn.* Syst. Nat. ed. XIII[a], I, 1788, 1073.

Seps marmoratus, Laur. Synops. Rept. 1768, 59.

Lacerta monitor, Latr. Hist. nat. Rept. I, 1801, 220.

Tupinambis monitor, Daud. Hist. nat. Rept. III, 1803, 20.—Kuhl, Act. Acad. nat. cur. XI, 1820, 125.—Maxim. Reise in Bras. I, 1820, 61 & 159; II, 1821, 138; Beitr. Naturg. Bras. I, 1825, 155.—Spix, Nov. Spec. Lacert. Bras. 1825, 19, Tab. xix.

Monitor meriani, Blainv. Bull. Soc. Philom. 1816, 111.

Tejus monitor, Merr. Tent. Syst. Amph. 1820, 61.—Maxim. Rec. Pl. d'Anim. Col. 1822.

Monitor teguixin, Fitz. Verz. Zool. Mus. Wien, 1826, 51.—Eichw. Zool. Spec. Ross. & Polon. III, 1837, 190.

Podinema teguixin, Wagl. Naturl. Syst. Amph. 1830, 133.—Wiegm. Herp. Mexic. I, 1834, 8.

Teguixin monitor, Gray, Synops. Rept. in *Griff.* Anim. Kingd. IX, 1831, 29.

Tejus teguixin, Shinnz. Naturg. und Abbild. Rept. 1833, 96, Pl. xxxv (Copies Maximil.).—Gray, Ann. Nat. Hist. I, 1838, 276; &, Catal. Lizz. Brit. Mus. 1845, 16.

Salvator merianae, Dum. & Bibr. Erpét. gén. V, 1839, 85.

Le teguixin, Daub. Quad. Ovip. & Serp. (Encyl. méth.), 685.

Le teyougouazou, Azzara, Ess. Hist. Nat. Quadr. Parag. II, 1802, 387.

Variegated lizard, Shaw, Gen. Zool. III, 1, 1802, 235, Pl. lxxiii & lxxiv.

La sauvegarde d'Amérique, Cuv. Règn. Anim. II, 1817, 27.

La grande sauvegarde d'Amérique, Cuv. Règn. Anim. 2d edit. II, 1829, 28.

The great American safeguard, Griff. in *Cuv.* Anim. Kingd. IX, 1831, 113.

Observ.—This animal having often been described and several times figured, we might have simply alluded to it here in recording it in this report. The beautiful figure of it, made by the artist of the Exploring Expedition, while at Rio de Janeiro, in January, 1839, has induced us to speak in general terms of its most prominent features.

Modern writers distinguish two species, apparently very closely allied, distributed over the same geographic range, and exhibiting the same general pattern of coloration, which, in both, is liable to variations of some minor degrees, according to age and sex.

The apparent organic differences between the two species alluded to by herpetologists, consist in the number of plates on the loral (phrenic) region, and the number also of shields along the upper part of the temporal region: differences which must necessarily appear very slight.

The Expedition brought home but one specimen, a prepared skin, about the size of the accompanying figure, which was made from another specimen, one-third larger. With such materials on hand, we cannot criticise the validity of the distinction drawn between the two species, and since the specimen before us exhibits the traits attributed

to *T. teguixin*, we have recorded it under that name, quoting such synonyms as are ascribed to it in the systematic works, leaving aside such of the ancient writers who, unaware of the above differences, have spoken indiscriminately of the two species.

The best and most accurate description of this species is that given in the "Erpétologie générale," to which we refer our readers.

The ground color of the upper regions is black, with yellow spots disposed or arranged in various manners. On the specimen before us, they are grouped, so as to simulate transverse fasciae or bands; sometimes, they are disposed upon two longitudinal zones, one on each side. The upper surface of the head and limbs is spotted with yellow. On the tail, the spots are arranged upon transverse rings. The inferior surface of the head and belly is yellow, maculated with black, which is sometimes in transverse bars or bands along the abdomen; the limbs and tail beneath being maculated with black.

Loc.—From the neighborhood of Rio de Janeiro, Brazil.

Plate XVIII, fig. 1, represents *Teius teguixin*, two-thirds the size of life.

Fig. 2, exhibits the upper surface of the head.

Fig. 3, is the inferior surface of the same.

Fig. 4, a side view of a finger.

Fig. 5, a side view of a toe.

Fig. 6, a group of dorsal scales.

Fig. 7, a group of abdominal scutellae.

Fam. ZONURIDAE.

A trait which will at once enable any observer to recognize a member of this family, consists in the presence, along the sides of the body, of a longitudinal zone, covered with granular scales, to which zone corresponds a fold of the skin. The back is protected with large, squarish, or rhombic scales, and the abdomen with rather well-developed scutellae. The body itself is elongated, somewhat depressed, generally provided with four limbs, and occasionally with the posterior pair alone, else none at all, or hidden under the skin. The head is pyramidal or depressed, covered with regular polygonal plates. The tongue

is flat, bifurcated at the tip. There is an external auricular aperture, and the eyes are provided with two valvular lids. The tail is either spinose or unarmed, sometimes excessively long, as for instance in the genus *Elgaria*, as represented on Plates XXII and XXIII, of the accompanying atlas.

Syn.—*Ptychopleuri*, Wiegm. Herp. Mex. I, 1834, 11.
Cyclosaures ptychopleures, Dum. &, Bibr. Erpét. gén. V, 1839, 336.
Zonuridae, Gray, Ann. Nat. Hist. I, 1838, 388; & Catal. Lizz. Brit. Mus. 1845, 45.
Cordyles, Gray, Catal. Lizz. Brit. Mus. 1845, 45.

Observ.—All the representatives of this family are strictly terrestrial, never making for the water, even temporarily, and keeping on the surface of the soil or in burrows. They belong to the warm climes of both hemispheres. They are inoffensive, without means of attack or defence, seeking after small animals to prey upon, such as feeble molluscs, annelids, and insects.

Genus ELGARIA, Gray.

Gen. Char.—Head subpyramidal, covered above with well-developed and smooth plates. Occipitals scale-like. Vertex plate largest. Two pairs of small internasals. An odd prefrontal, and a pair of postfrontals. Dorsal scales disposed upon transverse and, at the same time, longitudinal series, moderately keeled, armless. Abdomen protected by twelve longitudinal series of subquadrangular and smooth shields. Femoral pores wanting. Limbs weak; five fingers and five toes, slender, unequal, plaited above and below. Tail subcylindrical, slender, tapering, much longer than the body and head together, surrounded with scales like those of the back, but arranged upon verticils.

Syn.—*Elgaria*, Gray, Ann. Nat. Hist. I, 1838, 390; &, Catal. Lizz. Brit. Mus. 1845, 54.

Observ.—The odd prefrontal plate is sometimes subdivided into two. The vertex plate is either subpentagonal or subhexagonal, elongated, narrower in front than behind, and also occasionally subdivided crosswise posteriorly. Five large supraoculars constitute a curved series, convex towards the vertex plate, with three smaller ones, be-

tween the concavity of the former series and the supraciliary series, which is composed of small, narrow, and elongated pieces, five in number.

1. Elgaria formosa, B. & G.

(Plate XXIII, figs. 10–17.)

Char. spec.—*Squamis dorsualibus in octo et quadraginta series transversales et sexdecim longitudinales dispositis. Scutis postnasalibus duobus, parvis. Scutellis praeanalibus quam abdominalibus minoribus. Supra olivaceo-viridescente, cum duodecim fasciis nigris undulatis trans collum et tergum, singulis fasciis unam tantum seriem squamarum operientibus, quarum apices sunt albi coloris; infra unicolori.*

Spec. Char.—Dorsal scales disposed upon forty-eight transverse and sixteen longitudinal series. Two small postnasals. Preanal shields smaller than the abdominal ones. Ground color above greenish-olive, with twelve undulating black bands across the neck and back, covering but one row of scales, which are tipped with white; beneath unicolor.

Syn.—*Elgaria formosa*, B. & G. in Proc. Acad. Nat. Sci. Philad. VI, 1852, 175.

Descr.—The head, which constitutes about the fifth of the length, the tail excluded, is subpyramidal; its surface is depressed, slightly concave, and sloping towards the snout. The maxillary teeth, the only ones present, are quite small, disposed upon one row, subconical, acute, and curved inwardly. The occipital plates, numbering three pairs, have a smooth appearance, with slight traces of subtubercular ridges; the anterior two pairs inclosing an odd and subcordiform one, whilst a few small scales may be observed between the posterior pair. The vertex plate is elongated, subhexagonal, broadest posteriorly, and somewhat concave laterally. There is a pair of postfrontals, and an odd prefrontal, larger than the latter individually. In advance of the prefrontal are two pairs of small internasals or interfronto-rostral. The rostral itself is quite low, and scarcely perceptible upon an upper view of the head (fig. 12). The nostril opens towards the posterior edge of an oblong nasal plate, between which and a rather large subquadrangular loral, may be observed two small postnasal plates. Three elongated

plates, border ridge-like, the antero-inferior rim of the orbit; the posterior, which is the longest, is situated beneath the pupil; the anterior one is the broadest, and is contiguous to the loral and the anterior supraciliary. The supraciliary ridge is composed of five plates, gradually diminishing in size posteriorly. The supraocular plates constitute two series: an internal, subcrescentic, composed of five rather large plates, the anterior of which being contiguous sideways to the postfrontal and anterior supraciliary, and, by its anterior angle, to the loral, whilst posteriorly it comes into contact with the temporal shields and occipital plates; the second series of supraoculars occupies the concavity of the first series, being lined exteriorly by the supraciliary ridge. The surface of the eyelid is covered with small, subquadrangular, flat, and pavement-like plates, whilst upon their edge they assume the appearance of a series of minute granules or beads. The temporal shields have pretty nearly the size and shape of the scales of the neck, and are provided with rudimentary keels. There are eight upper labials from the rostral to the posterior edge of the orbit. The inferior labials are disposed upon two series: an upper one, composed of six narrow plates, narrowest and longest posteriorly, whilst in the inferior series, which contains but five plates, the latter increase in size backwards. The symphyseal plate is smaller than the rostral. The anterior pair of mental shields is very small; the three next pairs are well developed; the third and fourth being the largest, and nearly equal.

The neck is slightly contracted, and about two-thirds the length of the head. The body is elongated, subcylindrical, thickest upon its middle region. There are forty-eight transverse series of scales from the occiput to the origin of the tail, nine of which belonging to the neck proper. The scales themselves are imbricated, strongly carinated, subtetragonal in shape; the middle row along the back being narrower anteriorly than posteriorly (fig. 15); they constitute likewise sixteen longitudinal series across the line of greatest thickness of the body. The keels of the dorsal region are more developed than on the sides, and constitute eight continuous ridges from head to tail. The granular lateral area or zone is about an eighth of an inch wide on the middle of the abdomen, widening forwards. From the middle of the abdomen posteriorly, the granules, in becoming larger, assume the shape of very small plates or scales. The abdominal scutellae are thin and smooth, broader than long on the middle of the abdomen (fig. 17);

they constitute twelve longitudinal series, or else six pairs, smallest under the neck; they likewise diminish in size laterally, and, on the preanal region, from subquadrangular, they assume a more rounded aspect, though not much diminished in size; in fact, they are as large here as on the pectoral region.

The anterior limbs are very slender and short; when they are stretched towards the head, the extremities of the fingers are made to reach the angle of the mouth; their insertion takes place in the granular area, contiguous, by their inferior surface, to the pectoro-abdominal shields. The upper and anterior surface of both the forearm and arm is covered with well-developed, polygonal, and subnodulous scales or plates, extending somewhat under the elbow, where they diminish considerably in size. On the inferior and posterior surfaces of the same organs, we observe very small scales, assuming a granular appearance towards the shoulder. The palm of the hand is minutely scaly. The fingers, five in number, are plaited above and below to the very root of the nails. The first or inner finger is the smallest; the next in length is the outermost or fifth; then the second, which is but slightly longer than the fifth; the third and fourth are the longest, and nearly equal in length, though the third stretches a little beyond the fourth. The nails are subconical, compressed, and slightly curved. The posterior limbs are somewhat longer and stouter than the anterior ones, and similarly inserted in the granular zone. The thigh is covered anteriorly and superiorly with keeled, and beneath with smooth scales, whilst on its posterior surface, the scales are very minute and granular in their appearance. The scales on the upper and anterior aspects of the leg proper are likewise keeled, though less conspicuously than on the thigh; they are smooth beneath and posteriorly, where they simply diminish in size without becoming granular. The feet have the same general structure as the hands; the sole is covered with small, elongated, and somewhat raised scales. The inferior surface of the toes has a verticillated appearance, arising from the disposition of the scales or plates, which are slightly nodulous, as well as under the fingers; a series of plates is observed on their upper surface. The first toe is the shortest; the second is the next in length; the third and fifth are nearly equal, whilst the fourth is the longest. The nails are subconical, compressed at the base, curved, and acute. The tail appears to be long and slender, judging of it from the portion preserved on the specimen figured, and which is almost as long as the body and head

combined; it is subcylindrical, conical, tapering gradually into a point; the scales covering it constitute continuous chains all around, in the shape of true verticils, of which fifty-six may be counted; on the upper surface, they are strongly keeled or carinated, inconspicuously so on the sides, and perfectly smooth beneath. The central upper as well as the central lower series present a somewhat different aspect from the adjoining series: the scales in the former being broader posteriorly than anteriorly, whilst in the latter they are posteriorly acuminated.

The ground color is greenish-olive. The upper surface of the head is unicolor; about twelve transverse undulating blackish bands on the upper regions, somewhat interrupted laterally, so as to isolate a series of patches along the back, traceable to a certain distance along the tail. These bands cover but one row of scales, the tip or posterior margin of which are whitish or greenish-white. The limbs are unicolor; the hind ones alone exhibiting black spots on the upper surface of the thighs. The inferior surface is unicolor also.

This species is closely allied to *Gerrhonotus multicarinatus*, of Blainville* (*Elgaria multicarinata*), from which it differs in the structure of some of the cephalic plates. Blainville himself is very brief of details, and Duméril and Bibron† do not contribute anything towards a more accurate knowledge of it, so that we are left somewhat in the dark upon several points of its structure. The figures accompanying Blainville's Memoir exhibit some of the differences we have alluded to. As a general rule, relying but little on the coloration as specific character, we did not mention it here as a distinguishing feature.

Gerrhonotus burnettii, Gray, appears to be closely allied also to this species, hence to *G. multicarinatus*, with which it is identified by some writers.

Loc.—This species inhabits the coast of Upper California.

Plate XXIII, fig. 10, represents a profile view of *Elgaria formosa*, size of life.

Fig. 11, is a view of the inferior region of the body and tail. The portion of the latter represented by a mere outline being missing.

Fig. 12, represents the head, seen from above.

* Nouv. Ann. Mus. Hist. Nat. IV, 1835, 289, Pl. xxv, fig. 2.

† Erpétologie générale, V, 1839, 404.

Fig. 13, is a front view of the head.

Fig. 14, exhibits the left hand from above.

Fig. 15, is intended to give a correct idea of the structure and shape of the dorsal scales.

Fig. 16, is a portion of the granular abdominal zone, taken on the middle region.

Fig. 17, represents some of the abdominal shields, from the middle region of the abdomen.

Figs. 14–17, are somewhat magnified views, in order to render the details more apparent.

2. Elgaria scincicauda, B. & G.

(Plate XXIII, figs. 1–9.)

Spec. Char.—Dorsal scales disposed upon fifty-two transverse and fourteen longitudinal series. Four unequal postnasal plates, and one loral. Fourth pair of mental shields, large. Preanal shields larger than the abdominal ones. Tail one-fourth longer than the body and head combined. Above brownish-olive, with ten transverse brown bands across the neck and back, covering but one row of scales, which are tipped with white. Beneath unicolor.

Syn.—*Tropidolepis scincicaudus*, Skilt. Amer. Journ. of Sc. VII, 1849, 202, figs. 1–3.

Elgaria scincicauda, B. & G. Rep. on Rept. in *Stansb.* Expl. Valley Gr. Salt Lake, Utah, 1852, 348, Pl. iv, figs. 1–3.

Descr.—This species, though closely allied to the preceding one in its general appearance, may, on a closer examination, be easily distinguished by the proportional development of some organic regions, as well as structural details, which may not be deemed unimportant: and first of all, the head and neck together constitute exactly the third of the length, from the tip of the snout to the vent, whilst these same regions are shorter in *E. formosa*. The limbs are considerably more developed than in the latter, particularly the anterior pair. The tail not being whole in *E. formosa*, nothing can be deduced from its proportional length, as restored on the figure, but in comparing the portion that is left, we find fifty-six annular rows of scales, and forty-nine only in *E. scincicauda*, upon the same extent. Next we find fifty-

two transverse series of scales from the occiput to the vent, constituting fourteen longitudinal series, instead of sixteen; of these fifty-two transverse rows, ten or eleven belong to the neck proper. The middle dorsal series presents the same form as in *E. formosa*, but the adjacent ones of the back and sides are proportionally broader and less trapezoid in their outline (fig. 7). The keels are less conspicuous, particularly on the sides. In *Elgaria formosa*, four pairs of continuous ridges appear prominently along the back, whilst in *E. scincicauda* five single series only are noticed. The granular zone is broader on the sides of the neck, and the auricular aperture larger in *E. scincicauda* than in *E. formosa*. The abdominal shields constitute twelve longitudinal series in both species, and forty-three transverse rows from the origin of the fore limbs backwards in this, whilst there are only forty of them in *E. formosa*. The preanal shields are considerably larger than the rest, in the species which is the subject of the present description. The pectoral and gular shields are irregular in size and shape. The mental shields acquire also a very great development. The vertex plate is subdivided, but, as we presume, merely accidentally. The outer row of supraoculars is more developed than in *E. formosa*, and apparently less than in *E. multicarinata*. The pavement-like plates covering the eyelids are also more conspicuous, and the occipital plates and temporal shields smoother. The scales on the upper and anterior part of the fore limbs are slightly keeled in both *E. formosa* and *E. scincicauda*. The hands and fingers have the same structure. The posterior surface of the thighs exhibits a much finer granulation in *E. scincicauda* than in *E. formosa*. The sole of the feet is covered with small, somewhat raised, and subtubercular scales in both species; the toes, constructed on the same pattern, present a greater development of the inferior scales in *E. scincicauda* than in *E. formosa*.

The ground color is brownish-olive. Ten transverse bands of blackish-brown, occupying one scale in width, may be observed from the neck to the origin of the tail, leaving a space of three scales between each; the tip or margin of the dark scales is generally whitish; while some of these dark bands run across a continuous row of scales, others make a sudden break, and pass to the adjoining row, immediately behind, or to the second and even third row, as observed towards the inferior region of the flanks. The upper surface of the head is spotted with brown. Brown blotches may be seen along the upper region of

the tail to a considerable extent. The inferior region, from the chin to the tip of the tail, is uniform yellowish-brown. The abdominal shields exhibiting a clouded streak along their medial line.

Loc.—Upper California, now the State of that name.

Plate XXIII, fig. 1, represents *Elgaria scincicauda*, size of life.
Fig. 2, is a view of the inferior region of the body and tail.
Fig. 3, represents the head, seen from above.
Fig. 4, is a front view of the head.
Fig. 5, exhibits the left hand, from above.
Fig. 6, the left foot, from above also.
Fig. 7, a group of scales from the dorsal region.
Fig. 8, is a portion of the granular zone, taken on the middle region.
Fig. 9, abdominal shields, from the middle region of the abdomen.
Figs. 5–9, are somewhat magnified.

3. Elgaria grandis, B. & G.

(Plate XXII, figs. 1–9.)

Char. spec.—*Squamis dorsualibus in quinquaginta series transversales et quatuordecim longitudinales dispositis. Scutis postnasalibus quatuor, inaequalibus. Scutellis praeanalibus quam abdominalibus minoribus. Cauda longissima, duplam fere corporis et capitis longitudinem attingente. Supra olivaceo-fuscescente, cum undecim fasciis fuscis trans collum et tergum, singulis fasciis unam tantum seriem squamarum operientibus, quarum apices sunt albi coloris; infra unicolori.*

Spec. Char.—Dorsal scales disposed upon fifty transverse and fourteen longitudinal series. Four unequal postnasal plates. Preanal shields smaller than the abdominal ones. Tail very long, nearly twice the length of the body and head combined. Above brownish-olive, with eleven brown bands across the neck and back, covering one row of scales, which are tipped with white. Beneath unicolor.

Syn.—*Elgaria grandis*, B. & G. in Proc. Acad. Nat. Sci. Philad. VI, 1852, 176.

DESCR.—There is quite a striking resemblance between this species and *E. scincicauda*, and, upon a first glance, it might appear premature to regard them as distinct from one another. The most striking difference consists in the proportional length of the tail, which, in the present species, is nearly twice the length of the body and head together, thus, much longer than in *E. scincicauda*. The limbs are more developed also than in the preceding species. There are fifty transverse rows of scales from the occiput to the origin of the tail, ten of which belonging to the region of the neck. The longitudinal series are fourteen in number, and provided with a moderate keel. The scales themselves are somewhat smaller than in *E. scincicauda*. The mental shields are less developed than in the latter species. The same is true with regard to the preanal scutellae or shields. The abdominal shields are smaller in the same proportions as the dorsal scales. The scales covering the anterior and upper parts of the limbs are almost entirely smooth, whilst in *E. scincicauda* several of the upper series are distinctly keeled. One hundred and eight verticils of scales may be counted from the base of the tail to its apex, which is very slender. The upper scales are slightly carinated or keeled; the lateral and inferior ones being smooth.

The ground color is brownish-olive. The head unicolor. Eleven dorsal, transverse, blackish bands, somewhat broken up along the back and lower portion of the flanks, covering but one scale, leaving its margin or else its tip whitish. These bands are more closely approximated in the present species than in *E. scincicauda*, in which we observe generally three rows of intervening scales, whilst there are only two in *E. grandis*. The inferior surface is unicolor.

LOC.—This species inhabits Oregon.

Plate XXII, fig. 1, represents a profile view of *Elgaria grandis*, size of life.

Fig. 2, exhibits the inferior surface of the same animal.

Fig. 3, the head, seen from above.

Fig. 4, front view of the head.

Fig. 5, the left hand from above.

Fig. 6, a group of dorsal scales.

Fig. 7, a portion of the granular zone, taken on the middle region of the abdomen.

Fig. 8, abdominal shields, from the middle region of the abdomen. Figs. 5–8, are drawn about twice the size of life.

4. Elgaria principis, B. & G.

(Plate XXII, figs. 9–16.)

Char. spec.—*Squamis dorsualibus in octo et quadraginta series transversales et quatuordecim longitudinales dispositis. Scutis postnasalibus tribus, inaequalibus. Scutellis praeanalibus quam abdominalibus majoribus. Cauda corporis et capitis longitudinem aliquanto excedente. Supra fusco-olivacea, maculis nigrescentibus in series longitudinales ordinatis; infra unicolori.*

Spec. Char.—Dorsal scales disposed upon forty-eight transverse and fourteen longitudinal series. Three unequal postnasals. Preanal shields larger than the abdominal ones. Tail longer than the body and head together. Above olivaceous-brown, with blackish spots disposed upon irregular longitudinal series. Beneath unicolor.

Syn.—*Elgaria principis*, B. & G. in Proc. Acad. Nat. Sci. Philad. VI, 1852, 175.

Descr.—The tail is but a little longer than the body and head together. The limbs are proportionally well developed. The head and neck constitute two-fifths of the length, from the tip of the snout to the base of the tail. The head is quite depressed. The vertex plate is nearly as broad anteriorly as posteriorly. The prefrontal is occasionally subdivided, as in the specimen figured (figs. 11 and 12). The occipitals are larger than in any of the other species. The external series of supraoculars may likewise be noticed for their size. The dorsal scales are disposed upon forty-eight transverse rows, from the occiput to the origin of the tail, constituting twelve longitudinal well-developed series, and two (one on each side) of much smaller ones; they are moderately keeled on the back. Well-marked keels may be observed on the scales covering the upper part of the limbs. There are fifty-four verticils of scales along the tail, from its origin to its apex, laterally keeled, as well as above.

The ground color is olivaceous-brown. There are dorsal blackish spots disposed upon several irregular longitudinal series. The head, the inferior surface of the body and tail are unicolor.

Loc.—Specimens of this species were collected up Puget Sound, Washington Territory.

Plate XXII, fig. 9, represents the profile of *Elgaria principis*, size of life.

Fig. 10, the same specimen, seen from beneath.

Fig. 11, the head, from above.

Fig. 12, a front view of the head.

Fig. 13, the left hand from above.

Fig. 14, a group of dorsal scales.

Fig. 15, a portion of the granular zone, taken on the middle region of the abdomen.

Fig. 16, a group of abdominal shields.

Figs. 11–16, are somewhat magnified.

Fam. AMPHISBAENIDAE.

In their external aspect, the representatives of this family resemble so much the serpents that several naturalists have classed them in the latter Order of reptiles. Their internal structure, however, leaves no doubt as to their real affinities with the Saurians or lizards at large.

Their body is elongated, cylindrical, or subcylindrical, and naked or scaleless. The skin, which is tough, exhibits transverse rings or circular verticils, nearly equal, each of which is subdivided into small quadrangular partitions, somewhat elevated, as tubercles would be, and generally symmetrical. There are no eyelids, and, in some instances, the eyes themselves are quite rudimentary and even entirely hidden; neither is there an external auricular aperture: a feature essentially characteristic of the order of Ophidians or serpents. The limbs are always wanting, the anterior pair as well as the posterior pair; they do not even appear in a rudimentary form, as is sometimes the case in certain serpents. The surface of the head is protected by plates or shields, varying in number and arrangement, according to

the genera. The tongue is flat, broad, subelliptical, posteriorly emarginated; it tapers off anteriorly, where it is moreover subdivided into two thin and smooth threads; otherwise, the surface of that organ is covered with large scale-like papillae, or else flattened, smooth, imbricated scales, rounded upon their free edge, which is directed towards the back part of the mouth.

The teeth are either firmly adhering to the jaw bones or else inserted upon their inner edge into a common groove, hence, giving two groups: the Acrodonts (*Amphisbaenidae*) and the Pleurodonts (*Lepidosternidae*).

Syn.—*Amphisbaenoidea*, Fitz. Neue Class. Rept. 1826, 11.
Amphisbaenidae, Bonap. Saggio, Distr. Anim. Vertebr. 1831.—Gray, Synops. Brit. Mus. 1840; & Catal. Tort. Croc. & Amphisb. Brit. Mus. 1844, 69.
Amphisbaenae, Wiegm. Herp. Mex. I, 1834, 20.
Cyclosaures glyptodermes, Dum. & Bibr. Erpét. gén. V, 1839, 464.
Lepidosternidae, Gray, Catal. Tort. Croc. & Amphisb. Brit. Mus. 1844, 73.

Observ.—The species which we record further on, the only one we possess of the present family, belongs to the group of Pleurodonts or *Lepidosternidae*.

Genus CEPHALOPELTIS, Müll.

Gen. Char.—One rostral and one cephalic plate; the latter covering the entire upper surface of the head. Snout protruding beyond the lower jaw, with the nostrils under its apex. Eyes not visible. Pectoral shields large. Four longitudinal depressed lines: a dorsal, an abdominal, and a lateral one, dividing the body into four elongated zones. Fifteen or more verticils around the tail.

Syn.—*Cephalopeltis*, Müll. in *Tied.* u. *Trev.* Zeitschr. f. Physiol. IV, 1832.—Wiegm. Herp. Mex. I, 1834, 20.—Gray, Catal. Tort. Croc. & Amphisb. Brit. Mus. 1844, 73.

Observ.—The four longitudinal lines which divide the surface of the body into as many areas are the result of the decussation of the dermic partitions upon the regions where they occur; they do not extend to the tail, except the dorsal one, which may slightly affect a few of the caudal verticils.

Cephalopeltis scutigera, Gray.

Spec. Char.—Pectoral shields from eight to twelve in number. Abdominal partitions regularly quadrangular, larger than the dorsal ones, which are more irregular, some being subelliptical. Fifteen caudal verticils, with the dermic partitions or squares larger than on the surface of the body. Color superiorly fulvous or white, with a reddish-brown spot upon each scale. The head and neck are unicolor, like the inferior region.

Syn.—*Amphisbaena scutigera*, Hempr. Verh. Gesell. Naturf. Freunde, Berl. I, 1820, 129.

Cephalopeltis cuvieri, Müll. in *Tied.* u. *Trev.* Zeitchr. für Physiol. IV, 1832, 253, Tab. xxi, figs. 6 & 7; & Tab. xxii, fig. 5, *a*, *b*, *c*.

Lepidosternon hemprichii, Wiegm. Handb. Zool. 1832, 186.

Cephalopeltis hemprichii, Wiegm. Herp. Mex. I, 1834, 20.

Lepidosternon scutigerum, Dum. & Bibr. Erpét. gén. V, 1839, 509.

Cephalopeltis scutigera, Gray, Catal. Tort. Croc. & Amphisb. Brit. Mus. 1844, 73.

Observ.—One specimen of this species brought home by the Expedition measures between seventeen and eighteen inches in total length, an inch and a quarter belonging to the tail. The body is subcylindrical, nearly equal in diameter throughout its whole length. The tail itself is bluntly rounded off, almost as thick at the apex as at the base. The head is rather small, subconical, broader than deep, and quite convex above. The nostrils, placed under the extremity of the rostrum, are conspicuous, close to the margin of the mouth, and opposite the edges of the symphyseal plate.

We observe twelve distinct pectoral shields symmetrically arranged right and left, and a few additional ones irregularly disposed upon the periphery of the principal group. Three pairs are much larger than the rest: an anterior and a posterior pair, contiguous upon their mesial line, and a medio-lateral pair, isolated by the former two. Three other and much smaller pairs, placed exteriorly to those already mentioned, come next into notice, and smaller still are those at the periphery of the group, and which have a tendency of being combined with the adjoining folds of the integuments.

Loc.—Rio de Janeiro, Brazil.

Fam. SCINCIDAE.

The Scincs and allied genera, which constitute the present family, have a fusiform or subcylindrical body, a rounded back, without either a dorsal crest or raised spines, or folds on the sides, and terminated by a cylindrical and tapering tail; it is covered with smooth, keeled, or striated and imbricated scales. The abdomen is protected by scales similar in shape and structure to those of the back. The limbs are generally four in number: two anterior and two posterior, more or less developed; sometimes, one pair only exists, and occasionally none at all. The fingers and toes are subjected to considerable variations in number and development. The neck is continuous with the chest. As to the head, it is subquadrangular, regularly shielded, or plated. The nostrils are lateral. The tongue is free, flattened, not sheathed, slightly emarginated anteriorly, with its surface entirely or partly papillar; generally, the papillae are scale-like; sometimes, a portion only are scale-like, whilst the others are filiform. The maxillary teeth are, generally speaking, slender and acerated; sometimes tuberculous. The palate is either toothed or toothless. The eyes are either distinct, wanting, or hidden under the skin; when they are distinct, they present either a double or a single lid.

When the eyes are wanting or hidden, we have the group of Typhlophthalmians; when they exist and present a double lid, we have the Saurophthalmians, and when the eyelid is single, the Ophiophthalmians. Of the first named group no specimens were collected by the Expedition.

Syn.—*Scincoides*, Oppel, Rept. Prodr. 1811, 20.

Scincoidea, Fitz. Neue Class. Rept. 1826, 23.

Scincoidiens, Cuv. Règn. Anim. ii, 1817, 52; &, 2d ed. II, 1829, 85.—Coct. Tab. synopt. Scincoid. in Compt. Rend. Acad. des Sc. IV, 1837, 14.—Dum. & Bibr. Erpét. gén. V, 1839, 511.

Scincidae, Gray, Ann. Nat. Hist. II, 1839, 287; Catal. Lizz. Brit. Mus. 1845, 70; &, Zool. Ereb. & Terr. vi, 1845, 6.

Scinci, Wiegm. Herp. Mex. I, 1834, 11.

Lépidosaures, Dum. & Bibr. Erpét. gén. V, 1839, 511.

Observ.—The Scincs are cosmopolite in their distribution, and ex-

clusively terrestrial in their habits, feeding on insects and small animals generally.

Subfam. OPHIOPHTHALMI.

The eyes are naked; the eyelids being rudimentary, circular, ring-like, and immovable. Auricular aperture exteriorly visible. The maxillary teeth are simple and conical; the palate being toothless. The tongue is scaly, nicked at the tip, which is bifid. Body fusiform or subfusiform; the scales being smooth, keeled, or striated. There are four limbs, weak and unequal. The fingers and toes varying in number. Femoral pores wanting. Preanal pores in a few genera.

Syn.—*Ophiophthalmes*, Cocr. Etud. Scincoid. 1836; &, Tabul. synopt. Scinc. in Compt. Rend. Acad. des Sc. IV, 1837, 17.—Dum. & Bibr. Erpét. gén. V, 1839, 805.
Ophiophthalmi, Fitz. Syst. Rept. 1843, 23.
Gymnophthalmidae, Gray, Catal. Lizz. Brit. Mus. 1845, 62.

Observ.—The representatives of this group are comparatively few in number, yet there are amongst them, genera having the ordinary aspect of the typical Saurians, others whose body elongates, and in which the limbs are so much reduced in their external development as to assume an ophidian or serpent-like appearance.

Genus CRYPTOBLEPHARUS, Wiegm.

Gen. Char.—Body subfusiform, subdepressed, covered with smooth scales, else very finely or indistinctly grooved. Head depressed, subpyramidal. Nostrils lateral, in a single plate. No internasal. An odd prefrontal. One pair of postfrontals; sometimes combined. A vertex plate. Parietals and middle occipital combined into one large plate. Tongue flat, scaly. Palate toothless. Eyelid rudimentary, circular. Auricular aperture moderate. Limbs four; five fingers and five toes, unequal, depressed. Subdigital plates smooth. Tail roundish, tapering into a point.

Syn.—*Cryptoblepharus*, Wiegm. in Nov. Act. Nat. Cur. XVII, 1, 1834, 204; &, Herp. Mex. I, 1834, 12.—Cocr. Etud. Scinc. 1836.—Gray, in Ann. Nat. Hist. II, 1839, 335; Catal. Lizz. Brit. Mus. 1845, 64; &, Zool. Voy. Ereb. & Terr. VI, 1845, 3.
Petia, Gray, MSS.

Observ.—The chief difference which exists between this genus and *Ablepharus*, to which it is closely related, consists in a circular eyelid, which forms a complete ring around the eye, though immovable and rudimentary. The posterior extremity of the vertex plate is contiguous to the anterior angle of the combined parietals and middle occipital, whilst in *Ablepharus* the large supraoculars of either side form a continuous chain posteriorly, which interposes itself between the vertex plate and the middle occipital; they are likewise well developed in the latter genus, whilst the parietals are wanting, their place being occupied by the posterior supraoculars. In *Ablepharus*, moreover, we observe two very large preanal shields, whilst in *Cryptoblepharus*, there are four preanal shields of moderate size, though larger than the adjoining scales on the interfemoral region.

1. Cryptoblepharus plagiocephalus, Grd.

(Plate XXVI, figs. 17–24.)

Spec. Char.—Scales of the body disposed upon twenty-eight longitudinal series around its middle region. Median series of subcaudal scales larger than the rest. Ground color above of a bronze or coppery hue, with two light lines: one on each side of the back, and margined with brown. Beneath unicolor, greenish, or orange.

Syn.—*Scincus plagiocephalus*, Peron, MSS.
Cryptoblepharus peronii, Coct. Etud. Scinc. 1836 (figured).
Ablepharus peronii, Dum. & Bibr. Erpét. gén. V, 1839, 813.
Cryptoblepharus boutonii, Gray, Catal. Lizz. Brit. Mus. 1845, 64.
Tiliqua buchanani, Gray, in Ann. Nat. Hist. II, 1839, 291.

Observ.—It is with hesitation and reluctance that we record the present species under the above appellation. We have been compelled to it by the want of specimens from the localities whence those of our predecessors were obtained. A question of such vital importance to zoological geography as the present one, is not to be passed over with indifference. The species is given by various writers as almost cosmopolite: we are ready to acknowledge the fact upon evidences, and these evidences, for us, are the various specimens themselves, compared carefully with one another.

Should their identity be established beyond any reasonable doubt, investigations on that subject are not to end there. It will then become of paramount importance to look back into the past history of the countries where the species now occurs, with a view to ascertain, if possible, as to whether it is indigenous to those countries or therein introduced.

Duméril and Bibron describe four varieties of coloration; the specimens before us agree with their second variety: the only one with which we are thoroughly acquainted. We believe it to be the one originally observed by Péron, and we restore the specific name proposed by him. We have made such a selection of the synonyms as in our judgment can rightly be assigned to it, leaving it with future investigations to decide on the identity or differences of those we have set aside.

On a sketch colored from living specimens obtained at Otaheiti, in September and October, 1839, the upper surface of the head, neck, body, tail, limbs, and sides exhibits a golden hue, variegated with black. A narrow golden streak, margined on either side by a black line, may be traced along the upper part of the flanks, from the supra-ocular region to the base of the tail. Beneath, the color is of a uniform dull white; sometimes bluish-grey. The specimens in alcohol, collected at the Sandwich Islands, present the same general pattern of coloration, with the exception, that the inferior surface is of a greenish-yellow. The golden hue of the upper regions, if it really existed, has left behind it an olivaceous tint.

Loc.—Specimens were collected at Otaheiti and at the Sandwich Islands.

Plate XXVI, fig. 17, represents *Cryptoblepharus plagiocephalus*, size of life.

Fig. 18, is an upper view of the head;

Fig. 19, a profile; and,

Fig. 20, an under view of the same region.

Fig. 21, exhibits the left hand from above;

Fig. 22, the same hand from beneath.

Fig. 23, a group of dorsal scales.

Fig. 24, a group of abdominal scales.

Figs. 18–24, are somewhat magnified.

2. Cryptoblepharus eximius, Grd.

(Plate XXVI, figs. 25–32.)

Char. Spec.—*Squamis in quatuor et viginti series circum medium corpus dispositis. Squamis subcaudalibus aequalibus vel subaequalibus. Supra subviridi, cum duabus claris lineis vel vittis in utroque latere; infra unicolori.*

Spec. Char.—Scales disposed upon twenty-four longitudinal series around the middle region of the body. Subcaudal scales equal or nearly so. Back greenish; two light lines or streaks on each side; beneath unicolor.

Syn.—*Cryptoblepharus eximius*, Grd. in Proc. Acad. Nat. Sci. Philad. November, 1857.

Descr.—It is a much smaller and more slender animal than the preceding species, gracefully elongated, with a depressed head and body; the tail being subcylindrical, and slightly depressed at the base only. The snout is more pointed; the eye larger, and the auricular aperture smaller than in the foregoing species. The three upper and middle scales of the rim of the orbit are proportionally more developed also. The scales constitute but twenty-four longitudinal series, instead of twenty-eight, around the middle region of the body, and beneath the tail they are nearly all equal.

The dorsal region is greenish or brownish-green. On each side, we observe two whitish or yellowish lines extending from the head to the base of the tail: the uppermost beginning at the nostril and passing over the orbit. The lowermost from beneath the orbit, bending slightly upwards behind the latter, hence straightway to the groins, after passing over the auricular aperture. These lines or streaks are margined with deep brown or chestnut; the middle space between them being entirely of the latter hue, so that at a first glance, there are three dark streaks, and two light ones. The inferior portion of the sides and upper surface of the tail and limbs are spotted or maculated with brown and white. A uniform bluish-brown pervades the inferior region of the

head and belly, whilst the tail is obscurely maculated or speckled with brown.

Loc.—Feejee Archipelago: "very common, especially in open grounds, near the sea."

Plate XXVI, fig. 25, represents *Cryptoblepharus eximius*, size of life.
Fig. 26, is an upper view of the head;
Fig. 27, a profile; and,
Fig. 28, an under view of the same region.
Fig. 29, exhibits the left hand from above;
Fig. 30, the same hand from beneath.
Fig. 31, a group of dorsal scales.
Fig. 32, a group of abdominal scales.
Figs. 26–32, are somewhat magnified.

Subfam. SAUROPHTHALMI.

The eyelids are conformed as in the majority of Saurians, movable or valvular, and approximating, so as to allow an entire closing up of the eye. The auricular aperture is either visible exteriorly or entirely hidden. The maxillary teeth are of various sorts. The palate toothed or toothless. The body is fusiform or subcylindrical; the tail also subcylindrical, and tapering. The scales being either smooth, keeled, or striated. Limbs four in number, more or less developed; sometimes two only: the posterior, rudimentary, or else none at all exteriorly apparent. Fingers and toes varying in number. Neither femoral nor preanal pores.

Syn.—*Saurophthalmes*, Coct. Tab. synopt. Scinc. in Compt. Rend. Acad. des Sc. IV, 1837, 17.—Dum. & Bibr. Erpét. gén. V, 1839, 553.
Saurophthalmi, Fitz. Syst. Rept. 1843, 22.

Observ.—Though the members of this group represent the true type of Scincs in their Order, there are genera which, in their general aspect, resemble so much the serpents, that several ancient authors have associated them with the latter; the partial or total absence of exteriorly developed limbs, and an elongated, snake-like body; and

even the fact that the auricular aperture is sometimes invisible, were as many traits analogous to those of the snakes. Still their valvular eyelids give them a peculiar physiognomy altogether at variance with all the known forms of Ophidians.

Genus OPHIODES, Wagl.

Gen. Char.—Head slender and depressed; snout conical. No teeth on the palate. Tongue bifid, covered anteriorly with granular, and posteriorly with filiform papillae. Maxillary teeth conical and simple. No external auricular aperture. Eyelid scaly. Nostrils lateral, perforating a small plate. Two pairs of internasals or frontorostral plates. Two postnasals and one loral. Body elongated, subcylindrical, rounded, covered with striated scales, which appear smooth when the epidermis is well preserved. No anterior limbs; posterior ones reduced to narrow, flattened, slender, and tapering flaps, protected by scales. Tail conical and pointed.

Syn.—*Ophiodes*, Wagl. Naturl. Syst. Amph. 1830, 159.—Dum. & Bibr. Erpét. gén. V, 1839, 788.—Gray, Catal. Lizz. Brit. Mus. 1845, 99.—Dum. & A. Dum. Catal. méth. Rept. Mus. d'hist. nat. II, 1851, 188.

Observ.—The structure of the tongue appears to constitute the chief generic feature in this genus: a large portion of its posterior surface being covered with villous papillae, whilst its anterior extremity exhibits a pavement of small granules. The granular portion is separated from the villous portion by a deep transverse groove, and the apex of the organ is subdivided into two angular points.

The history of the genus *Ophiodes* is somewhat interwoven with that of *Pygodactylus*, established by Merrem in 1820. Fitzinger, in 1826, misunderstood the species upon which it was founded, and was followed in 1830 by Wagler, who proposes to suppress Merrem's genus. Duméril and Bibron in 1839, and Gray in 1845, rendered the subject still more intricate, when Fitzinger himself, in 1843, restored both *Ophiodes* and *Pygodactylus* as distinct genera, giving up his claims to the genus *Pygodactylus*, and abandoning also that of *Scelotes*, likewise proposed by him in 1826, and upheld by Gray and the herpetologists of the Paris Museum.

Ophiodes striatus, Wagl.

Spec. Char.—Body subcylindrical, tapering, surrounded upon its middle with twenty-seven longitudinal series of scales. Snout subconical and rounded. A postnasal plate and one loral. Two pairs of parietals and four occipitals. Two series of supraoculars, of five plates each. Lower eyelid scaly. Olivaceous-brown, provided above with longitudinal dark brown lines or streaks, varying in number, according to age. Beneath lighter and unicolor.

Syn.—*Pygodactylus gronovii*, Fitz. Neue Class. Rept. 1826, 53 (non *Pygodactylus gronovii*, Merr.).—Wagl. Isis, XXI, 1828, 741; &, Naturl. Syst. Amph. 1830, 160.

Pygopus striatus, Spix, Spec. nov. Lacert. Bras. 1825, 25. Tab. xxviii, fig. 1.

Pygopus cariococca, Spix, Spec. nov. Lacert. Bras. 1825, 26. Tab. xxviii, fig. 2.

Ophiodes striatus, Wagl. Isis, XXI, 1828, 740; &, Naturl. Syst. Amph. 1830, 159.—Gray, in Ann. Nat. Hist. II, 1839, 334.—Dum. & Bibr. Erpét. gén. V, 1839, 789.—Gray, Catal. Lizz. Brit. Mus. 1845, 99.—Gravenh. in Nov. Act. Nat. Cur. XXIII, i, 1851, 379. Pl. xliv.

Bipes striatus, Cuv. Règn. Anim. 2d ed. II, 1829, 65.—Griff. Anim. Kingd. IX, 1831, 161.

Bipes cariococca, Cuv. Règn. Anim. 2d ed. II, 1829, 65.—Griff. Anim. Kingd. IX, 1831, 161.

Bipes striatus, Gray, Synops. Rept. in *Griff.* Anim. Kingd. IX, 1831, 73.

Observ.—Were the nomenclature of the various plates and shields which protect the head, more precise, we would have simply alluded to the present species, whose history and zoological traits can easily be traced through the authors quoted in the above synonymy. The following description is offered, in order to render our Report as accurate as circumstances will permit:

Descr.—The head is slender and depressed, tapering towards the snout, which is subconical, and rounded upon its periphery. The rostral plate is large and hemidiscoid; immediately behind, are two pairs of rhomboid internasals of moderate size; the anterior pair is the smallest, situated transversely upon the snout, between the nasals. The posterior pair is contiguous laterally to the postnasal and the loral. There is a large, odd, heptagonal frontal, contiguous anteriorly to the internasals, laterally to the loral and first supraocular of each series, and posteriorly to the vertex plate. The latter is the largest of all, elongated, narrowest in front, and subhexagonal; it is contiguous

anteriorly to the frontal, laterally to the anterior three inner supraoculars, and posteriorly to the inner pair of parietals, and anterior occipital; the latter is pentagonal, posteriorly acute-angled, and contiguous to a subrhomboid postoccipital. A pair of latero-occipitals of considerable development is observed, one on each side of the anterior and posterior occipitals, contiguous anteriorly with both parietals, and laterally with the temporal shields. The parietals are subquadrangular, longer than broad, and nearly equal in size; the inner pair is contiguous by its longest sides to the vertex plate, outer parietal, and latero-occipital; anteriorly to a portion of the second and third inner supraoculars, and posteriorly to the anterior occipital; the outer pair is limited in front by the inner parietal, sideways by the latero-occipital and first and second inner supraoculars, and posteriorly by the temporal shields. The inner series of supraoculars are large; the outer series of moderate development. There are no supraciliaries, the outer supraoculars occupying their place. The nasal is surrounded anteriorly by the rostral, superiorly by the first internasal, inferiorly by the first labial, and posteriorly by the postnasal, which is rhomboid. The loral is well developed, somewhat bent, though angular, extending slightly to the upper surface of the head. The rim of the orbit is formed above by the series of outer supraoculars, and below by a series of nine small plates, interrupted beneath the pupil by the fifth labial, which enters into the orbital chain, leaving five infraorbitals behind, and four in front. The posterior five infraorbitals constitute a chain extending from the fifth labial to the posterior inner supraocular, whilst the anterior four extend from the fifth labial to the anterior inner supraocular. The anterior infraorbital is much larger than the rest, and is called by some writers anteorbital; it truly occupies, with the second plate of the same series, the anterior rim of the orbit. The four anterior upper labials diminish in size posteriorly; the fourth being smaller than the fifth; the following, three in number, are large, resembling in shape and size the temporal shields. The symphyseal is hemidiscoid, one half smaller than the rostral. There are eight subquadrangular lower labials, narrow in front, elongated behind. A series of seven infralabials are here observed between the series just alluded to and the mental shields, properly so called, of which there are four pair and an odd one in front, contiguous to the symphyseal, whilst the others diverge; the anterior pair alone being contiguous upon the middle line of the chin.

Twenty-seven longitudinal series of scales may be counted across the middle region of the body, slightly larger on the back than on the sides and belly.

The largest specimen before us measures about fifteen inches, and exhibits anteriorly four, and posteriorly eight, brown lines or streaks along the upper region of the back and tail. In the young, these lines are more numerous, running likewise on the sides. The sides of the head are spotted with brown and white; the brown appearing at distance, as though there were vertical lines or bars across the face.

Loc.—Rio de Janeiro, Brazil.

Genus TILIQUA, Gray.

Gen. Char.—Body subfusiform, stoutish, protected by keeled scales. Head subquadrangulo-pyramidal. Nostril in one plate, oblong, lateral; one pair of supranasals. Parietals and middle occipital distinct. Lower eyelid scaly. Auricular aperture denticulated in front. Maxillary teeth compressed. Palate toothed. Limbs four, stout, rather distant; five fingers and five toes, compressed, unequal, clawed. Subdigital plates smooth. Palms and soles granular. Tail subcylindrical, tapering; scales beneath wide.

Syn.—*Tiliqua*, Gray, in Zool. Journ. III, 1827, 227; Ann. Nat. Hist II, 1839, 288; &, Catal. Lizz. Brit. Mus. 1845, 108.—Fitz. Neue Class. Rept. 1826, 23.
Eutropis, Fitz. Syst. Rept. 1843, 22.

Observ.—A genus which has undergone various modifications since first proposed. Not being well understood when established, species of most diversified structure were placed in it by several authors. It is one of those that need be carefully examined, and critically compared to *Euprepis*, and other congeners. We regret not having the means of going any further into its study.

Tiliqua rufescens, Gray.

Spec. Char.—Nasal plates lateral; supranasals nearly contiguous or

separated. Rostral well developed, hemidiscoid. Auricular aperture moderate, subovate, provided anteriorly with small projecting scales. Dorsal scales tricarinated. Preanal scales equal. Tail depressed at the base, rounded, and tapering into a point posteriorly, and longer than the body and head together. Dark-brown above, with a series of black spots. A lateral dark streak, with a light fillet above and below. Beneath light brown, with greyish lines.

Syn.—*Lacerta rufescens*, Shaw, Gen. Zool. III, 1, 1802, 285.

Scincus rufescens, Merr. Tent. Syst. Amph. 1820, 71.—Cuv. Règn. Anim. 2d ed. II, 1829, 62.—Griff. *Cuv.* Anim. Kingd. IX, 1831, 157.

Scincus multifasciatus, Kuhl, Beitr. Zool. &c. 1820, 12.

Mabouya multicarinata, Fitz. Neue Class. Rept. 1826, 52.

Euprepis multifasciatus, Wagl. Naturl. Syst. Amph. 1830, 162.

Eumeces rufescens, Wiegm. Herp. Mex. I, 1834, 36.

Tiliqua carinata, Gray, in Zool. Journ. III, 1827, 227; &, Ann. Nat. Hist. II, 1839, 289.

Tiliqua affinis, Gray, in Ann. Nat. Hist. II, 1839, 289.

Euprepes sebae, Dum. & Bibr. Erpét. gén. V, 1839, 692.

Tiliqua rufescens, Gray, Catal. Lizz. Brit. Mus. 1845, 109.

Indian Tiliqua, Gray, Synops. Rept. in *Griff.* Anim. Kingd. IX, 1831, 68.

Observ.—We find in the collection submitted to our examination but one specimen of this species, measuring about two inches in length, from the apex of the snout to the tip of the tail: hence, quite immature. We are satisfied, however, as to its identity.

The coloration, according to accounts, varies within considerable limits. In the specimen before us, the dorsal region and upper surface of the tail are of a dark brown hue. A lateral darker streak extends from the eye to the base of the tail, being margined above and below by a light line reduced to a series of crowded light spots. Along the uppermost of these lines may be observed a series of dark spots extending from the head to the base of the tail. The lateral dark streak may be followed in advance of the eye to the nostril under the shape of a narrow band. The limbs above are brown, speckled with whitish or yellowish. The lower part of the sides, beneath the lower light line, is brown also, whilst the inferior surface assumes quite a light brown tint; the throat and belly exhibiting greyish lines along each row of scales; the limbs and tail being unicolor.

Loc.—Mangsi Island, Philippine Group.

Genus EUPREPIS, Wagl.

Gen. Char.—Body subfusiform, protected by keeled scales. Head subconical and depressed. Nostril in one plate; one pair of supranasals. Parietals separated, contiguous, or united into one plate. Middle occipital distinct, or combined with the latero-occipitals; a pair of postoccipitals. Lower eyelid with a transparent disk. Auricular aperture more or less conspicuously denticulated or lobulated in front. Maxillary teeth compressed and truncated. Palate toothed. Limbs four, strong; five fingers and five toes, compressed, unequal, clawed. Subdigital plates smooth. Palms and soles tubercular. Tail subconical and tapering.

Syn.—*Euprepis*, Wagl. Naturl. Syst. Amph. 1830, 161.—Wiegm. Herp. Mex. I, 1834, 11.—Dum. & Bibr. Erpét. gén. V, 1839, 663.—Gray, Catal. Lizz. Brit. Mus. 1845, 110.—Dum. & A. Dum. Catal. méth. Rept. Mus. d'hist. nat. ii, 1851, 158.

Observ.—The elements which constitute this genus are, as yet, more or less intermingled with those arranged under the head of *Tiliqua*, requiring a thorough and critical study: a task we could not undertake for want of sufficient materials at our command. Should it also become necessary to separate generically *Euprepis delandii*, *E. belcheri*, *E. gravenhorsti*, and *E. venustus*, the above diagnosis must then be partially modified, so as to read: "parietal plates separated; middle occipital, distinct." Then also the portion of the diagnosis of *Rachites* or *Chionia*, whichever of these names be chosen for the species just alluded to, will read: "parietal plates united into one; middle occipital combined with the latero-occipitals." The remaining generic characters may likewise have to be further subdivided. Thus, we would have a genus analogous to the one proposed further on, under the appellation of *Emoa*, embracing such *Eumeces* in which a similar union of the cephalic plates is observed.

Euprepis venustus, Grd.

(Plate XXVI, figs. 1–8.)

Char. spec.—*Corpore et capite gracilibus atque depressis. Cauda postice subconica. Squamis in tres et quadraginta usque ad quinque et*

quadraginta series longitudinales dispositis. Scuto praefrontali rhombiformi. Squamarum praeanalium externa serie reliquis majore. Supra spadiceo. Vitta nigra ab oculo usque ad caudae basim extensa; superne margine fuliginoso ornata, a regione superciliari ad tertiam anteriorem caudae partem extendente; inferne linea flava ab axillam ad inguen percurrente. Inferiore lateris parte lutea, nigro-punctata. Gula albescente; abdomine pallide fusco, unicolori.

Spec. Char.—Body and head slender and depressed. Tail subconical posteriorly. Forty-three to forty-five longitudinal series of scales. Prefrontal plate lozenge-shaped. External row of preanal scales larger than the rest. Back chestnut-brown. A fuliginous line extending from the supraciliary region to the anterior third of the tail. A black streak from the eye to the base of the tail. A yellow line from the axilla to the groin. Lower portion of the flanks yellow, speckled with black. Throat whitish. Abdomen light brown, unicolor.

Syn.—*Euprepis venustus*, Grd. in Proc. Acad. Nat. Sci. Philad. November, 1857.
Chionia venusta, Grd. MSS.

Observ.—This species is very closely allied to *E. delalandii*, *E. belcheri*, and *E. gravenhorsti*, with which it might constitute a generic group, characterized by the peculiar conformation of some of the cephalic plates. Whenever such a classification should be deemed advisable, there are two names already framed and claiming admittance: *Rachites* is the first on the list, and, if not admissible, *Chionia* will come next.*

Our *E. venustus* differs from *E. delalandii* by the form of the prefrontal (internasal) plate, which is lozenge-shaped, instead of hemidiscoid, the number of longitudinal series of scales, which are forty-three or forty-five, instead of forty-seven or forty-nine, and by the preanal scales, the exterior row being larger than the preceding rows, and which are all equal in *E. delalandii*.

Descr.—The head and body are very much depressed; the latter broader than deep, whilst the former is broad across the occipital

* John Edward Gray, in the Catalogue of the Lizards in the British Museum, has already pointed out this group under the appellation of *Chioninia*, but as it seems not as a genus or a subgenus.

region, tapering considerably towards the snout, which is subconical. The tail, somewhat depressed at the base, is subconical upon the rest of its length, and tapers into a point. The fore limbs, when bent forwards, will reach the anterior rim of the orbit with their longest finger. The only specimen before us measures four inches and a quarter, two inches belonging to the head and body combined, the rest to the tail. The species attains larger dimensions, for, a colored sketch, made from life in October, 1838, represents an individual more than six inches in total length.

According to our nomenclature, the cephalic plates are: two supranasals, contiguous; a prefrontal, lozenge-shaped; two subrhomboid postfrontals; a vertex plate, pentagonal, elongated, and narrowest posteriorly; a parietal, subhexagonal, narrowest anteriorly; an occipital, large, and crescent-shaped; two small postoccipitals; five temporal shields, scale-like, and subrhomboid; one nasal; one postnasal; two lorals; five supraoculars, and five supraciliaries.

The rostral is prominently convex, elevated, extending somewhat to the upper surface of the snout. The internasals are well developed, elongated, broadest anteriorly, and contiguous exteriorly to the nasal and postnasal. The prefrontal, as already observed, is lozenge-shaped, contiguous anteriorly to the internasals, laterally to the first loral, and posteriorly to the postfrontals. The second and third supraoculars are the largest of the series; the fifth is very small, and contiguous, together with the fourth and last postorbital, to the angle of the occipital. The temporal shields constitute two series; the uppermost, composed of three shields, extends between the sixth labial and the postoccipital, whilst the lowermost, composed of two shields only, extends from the seventh labial to the scales of the neck. The postnasals are very small, and situated between the first labial beneath, the anterior loral behind, the internasal above, and nasal in front. The posterior or second loral is quite large, and is the plate which enters elsewhere into the orbit, and then called anteorbital or foremost infraorbital.

The dorsal scales are conspicuously carinated, whilst on the sides, the keels become quite obsolete, and along the abdomen, they appear perfectly smooth. The caudal scales are smooth, and considerably larger than around the body. On the upper aspect of the limbs, the scales are likewise keeled, and smooth or nearly so beneath.

The upper surface of the head and the dorsal region are chestnut-

brown. A fuliginous band may be seen extending from the supraciliary region along the upper portion of the flanks to a certain distance on the tail, where it tapers into a point; over the eye and along the canthus rostralis, it is reduced to a whitish fillet. Immediately beneath that band is a blackish streak, which may be traced from the nostril across the eye, over the auricular aperture, to the origin of the tail, broadest along the middle of the flanks. From the axilla to the groin, is a yellowish line margining the dark streak just alluded to. The lower portion of the sides is yellow or yellowish-brown, speckled with black; the speckles extending beyond the middle of the length of the tail, as a continuation of the dark streak of the sides. The legs are brown, with darker spots interspersed. The lips are yellowish, the throat whitish, obscurely lineolated on the sides, whilst the abdomen is dull yellow or brownish, unicolor.

Loc.—San Jago, Cape de Verde Islands, where it is said to be "pretty common."

Plate XXVI, fig. 1, represents *Euprepis venustus*, size of life.
Fig. 2, the head seen from above;
Fig. 3, a profile; and,
Fig. 4, an under view of the same region.
Fig. 5, the left hand from above;
Fig. 6, the same hand from beneath.
Fig. 7, a group of dorsal scales.
Fig. 8, a group of abdominal scales.
Figs. 2–8, are somewhat magnified.

Genus CYCLODUS, Wagl.

Gen. Char.—Body subfusiform, thickish, elongated, depressed, laterally rounded off. Tail subconical and tapering. Scales large, bony; above slightly rugose, with obscure central grooves; beneath also obscurely grooved, and laterally smooth. Head subquadrangular, subpyramidal, with an obtuse snout. Maxillary teeth subhemispherical. Palate toothless. Tongue flattened, scaly, nicked at the apex. Auricular aperture large, denticulated anteriorly. Eyes surrounded by a series of small plates; lower eyelid scaly. Nostrils in one plate. No supranasals. One pair of parietals. Limbs four,

short; five fingers and five toes rather short, unequal, subcylindrical, simple, clawed.

Syn.—*Cyclodus*, Wagl. Naturl. Syst. Amph. 1830, 162.—Wiegm. Herp. Mex. I, 1834, 11.—Dum. & Bibr. Erpét. gén. V, 1839, 747.—Gray, Catal. Lizz. Brit. Mus. 1845, 103.—Dum. & A. Dum. Catal. méth. Rept. Mus. d'hist. nat. ii, 1851, 178.

Observ.—The peculiar shape of the teeth is a character which will readily distinguish this genus from its congeners, to which it is allied by the conformation of the cephalic plates. Its large and bony scales constitute another feature not less characteristic, as also the shortness of its fingers and toes.

Cyclodus gigas, Gray.

Spec. Char.—Auricular aperture provided anteriorly with one series of projecting scales. A groove over the upper labials. Prefrontal plate broader than long. Vertex plate elongated, lanceolated, posteriorly acute. Four elongated temporal shields behind the eye. Yellowish-brown, transversely banded above with black. A postorbital black streak extending sometimes to the neck. Beneath unicolor.

Syn.—*Scincus gigas*, Bodd. in Nov. Act. nat. cur. VII, 1781, 5.—Schn. Hist. Amph. II, 1801, 202.—Daud. Hist. nat. Rept. IV, 1802, 244.—Merr. Tent. Syst. Amph. 1820, 73.—Boie, Erpét. Java, MS.

Lacerta scincoides, Shaw, in *White*, Journ. Voy. N. S. Wales, 1790, 242, Pl. xxx; &, Nat. Misc. V, 1794, Pl. clxxix.

Scincus crotaphomelas, Lacep. in Ann. Mus. d'hist. nat. IV, 1804, 192 & 209.—Cuv. Règn. Anim. 2d ed. II, 1829, 63.

Scincus scincoides, Cuv. Règn. Anim. II, 1817, 54; &, 2d ed. II, 1829, 63.—Griff. *Cuv.* Anim. Kingd. IX, 1831, 158.

Scincus tuberculatus, Merr. Tent. Syst. Amph. 1820, 73.

Tiliqua gigas, Fitz. Neue Class. Rept. 1826, 52.

Tiliqua scincoides, Fitz. Neue Class. Rept. 1826, 52.

Cyclodus flavigularis, Wagl. Descr. & Icon. Amph. 1833, Pl. vi; &, Naturl. Syst. Amph. 1830, 162.—Wiegm. Herp. Mexic. I, 1834, 11.

Tiliqua whitii, Gray, Synops. Rept. in *Griff.* Anim. Kingd. IX, 1831, 67; &, Ann. Nat. Hist. II, 1839, 288.

Cyclodus boddaertii, Dum. & Bibr. Erpét. gén. V, 1839, 752.

Cyclodus gigas, Gray, Catal. Lizz. Brit. Mus. 1845, 103.

Australasian galliwasp, Shaw, Gen. Zool. III, i, 1802, 288 & 289, Pl. lxxxi, fig. 2.

Le scinque ordinaire de la Nouvelle Hollande, Daud. Hist. Nat. Rept. IV, 1802, 236.
Keneux de Boddaert, Cocr. Tab. synopt. Scinc. (Compt. Rend. Acad. des Sc. IV, 1837.)

Observ.—We find but one specimen of this species in the collection of the Exploring Expedition: a prepared skin of a female individual, measuring twenty inches and a half from the apex of the snout to the tip of the tail. It is the largest species of the Scinc family, and one, therefore, often noticed by travellers and naturalists.

Descr.—The tail measures about seven inches, and the head two and a half inches. There are thirty-eight longitudinal series of scales around the body. The dorsal and abdominal scales exhibit obscure central grooves, whilst on the sides they are nearly smooth. The lateral scales are smaller than the rest, disposed upon series converging towards the back.

The auricular aperture is moderate, oblong, obliquely situated beneath and behind the temples, anteriorly provided with one series of projecting scales, giving that margin a denticulated aspect. The inferior rim of the orbit is composed of seven small, subquadrangular plates, somewhat larger anteriorly than posteriorly. The supraciliaries are six in number, polygonal or subrhomboid; the second and third, by far the largest: they complete the rim of the orbit. There are four supraoculars; the anterior is the smallest, and the second the largest. The nasal is rhomboid, with the nostril in its middle. We observe a subquadrangular postnasal, and a subtrapezoid loral. There are no supranasals. The odd prefrontal, large and lozenge-shaped, somewhat broader than long, is contiguous to the rostral by its anterior angle. The nasals nearly approximate upon the middle line of the snout. Laterally, the prefrontal meets the postnasal, it being limited posteriorly by the postfrontals. The latter are rhomboid, contiguous laterally to the postnasal and the loral, and posteriorly to the first and second supraoculars and the vertex plate. The vertex plate itself is elongated, subcordate, or sublanceolated, obtusely hexagonal, with its acute angle directed backwards, where it is limited by a pair of rhomboid parietals. The latter are contiguous sideways to the third, fourth, and fifth supraoculars, and behind to the odd occipital and latero-occipitals. The middle or odd occipital is elongated, obscurely hexagonal, tapering posteriorly, with its sides subconcave; anteriorly, as already observed, it is contiguous to the parie-

tals, sideways to the latero-occipitals, and posteriorly to the occipital shields. The latero-occipitals are the largest cephalic plates, anteriorly contiguous to the fifth and sixth supraoculars, sideways to the upper temporal shield, and behind to the occipital shields. The latter are scale-like, somewhat larger than the scales of the upper region of the neck, and irregular in shape, especially the anterior cross series. Four elongated, temporal shields extend from the orbital ring to about midway towards the auricular aperture. The posterior upper labial, the seventh in the series, is still larger than the temporal shields just alluded to, and under which it partly lies. The remaining upper labials are subquadrangular, subequal, a little deeper than long, and smallest anteriorly. The rostral itself is moderate and subpyramidal. The symphyseal is moderate also, followed on either side by ten lower labials, largest upon the middle of the series; the anterior one being the smallest, very narrow and elevated. The mental shields are broadly developed: we observe an anterior odd one and three diverging pairs, the first pair alone being contiguous upon the medial line of the chin.

Loc.—Sydney, New South Wales, Australia.

Genus CYCLODINA, Girard.

Char. gen.—*Corpore elongato, gracili, subquadrangulari, depresso; squamis magnis et rugosis, sub epidermide plana, coöperto. Capite parvo, depresso, antice obtuso. Nare in scuto uno; scutis supranasalibus nullis; parietalibus duobus. Dentibus maxillaribus conicis; palatinis nullis. Lingua plana, squamosa, ad extremitatem emarginata. Palpebra inferiori squamosa. Apertura auditoria simplici. Membris quatuor, debilibus, valde distantibus. Digitis utriusque membri quinque, brevioribus, subcylindricis, et uncinatis; subtus laevibus, transverse scutellatis; palmis plantisque crasse granulosis vel subtuberculatis. Cauda modica.*

Gen. Char.—Body elongated, slender, subquadrangular, depressed; covered with large rugose scales, under a smooth epidermis. Head small, depressed, anteriorly obtuse. Nostril in one plate; no supranasals; a pair of parietals. Maxillary teeth conical. Palate toothless. Tongue flat, scaly, nicked at the extremity. Lower eyelid

scaly. Auricular aperture simple. Limbs four, weak, far apart; five fingers and five toes, rather short, subcylindrical, and clawed; their under surface transversely plated, smooth. Palms and soles coarsely granular or subtubercular. Tail moderate.

SYN.—*Cyclodina*, GRD. in Proc. Acad. Nat. Sci. Philad. November, 1857.

OBSERV.—The species which constitute the present genus may truly be termed diminutive Cyclodi, for, their affinities with the latter are most intimate. They differ therefrom chiefly by the subquadrangular shape of their body, their conical teeth, their auricular aperture, simple, instead of being denticulated anteriorly. Finally, the number of longitudinal series of scales around the body are much less numerous than in *Cyclodus*, as understood by John Edward Gray, that is, not including *Cyclodus casuarinae*.

It appears to us that *Lygosoma temminckii*, DUM. & BIBR. (Erpét. gén. V, 1839, 727), will prove congeneric with the species described below.

CYCLODINA AENEA, Grd.

(Plate XXVI, figs. 9–16.)

CHAR. SPEC.—*Corpore longiusculo, viginti sex seriebus squamarum longitudinalibus coöperto. Rostro brevi. Scutorum serie suborbitali integra; scutis labialibus in orbitam non productis. Apertura auditoria parva. Scutellis praeanalibus duabus medianis quam reliquis majoribus. Membris bene parvis. Colore auratili viridescente; dorso nigro punctato; vitta obscure spadicea vel subnigra, superne albo marginata, in latere superiori sita. Lateribus albo nigroque punctatis. Gula et mento nigro punctatis. Abdomine pallide, fulvo, unicolori.*

SPEC. CHAR.—Body rather long, protected by twenty-six longitudinal series of scales. Snout short. Suborbital chain of plates complete; no labials entering into the orbit. Auricular aperture small. Two middle preanal scales larger than the rest. Limbs quite small. Golden-green; back speckled with black. A dark chestnut or blackish streak, obscurely white-lined above, runs along the upper portion of the flank. Sides speckled with white and black. Under

surface of head and throat speckled with black. Abdomen light yellowish, unicolor.

SYN.—*Cyclodina aenea*, GRD. in Proc. Acad. Nat. Sci. Philad. November, 1857.

DESCR.—The body though elongated when compared to its congeners, the general aspect of this species is rather abbreviated. This must be owing to its short and small head, as well as to its short tail. The latter, however, is reproduced, so that after all the entire physiognomy may be of a more graceful and elongated type.

The rostral plate is elevated, subconical, extending somewhat to the upper surface of the snout, keeping the nasals widely apart by its contiguity to the prefrontal. The nasals themselves are lateral. The prefrontal is subrhomboid, broader than long, and contiguous laterally to the nasal and postnasal, and posteriorly to the vertex plate, thus preventing the postfrontals coming into contiguity upon the middle line of the head. The postfrontals themselves are small, extending somewhat to the loral region. The vertex plate is large and elongated, anteriorly angular, posteriorly tapering and spear-shaped, slightly overlapping the parietals. The latter are well developed, receiving posteriorly the angular and broad extremity of the middle occipital, which is shaped like the vertex plate, being tapering and spear-shaped posteriorly. The latero-occipitals are the largest of the cephalic plates, inclosing posteriorly the middle occipital, being contiguous anteriorly to the parietals, slightly to the last supraocular and two postorbitals; laterally, it is lined by the upper temporal shield, and posteriorly by the scales of the neck or a pair of postoccipitals; the latter not always distinct from the adjoining scales of the neck. The supraoculars are four in number; the anterior one smallest; the second and third largest. The supraciliaries are proportionally well developed, subquadrangular, subequal, seven in number. The nasals are subrhomboid, longer than deep, obliquely situated upon the sides of the muzzle. The postnasal and loral, both, are deeper than long, likewise obliquely inclined forwards, and owing their shape to the abbreviation of the entire snout. Of the three anteorbitals, the upper and lower are small and subequal, whilst the middle one is larger, entering but partially into the orbit. There is a complete chain of small suborbitals; hence the labials not coming into the orbit; seven of them may be counted forming an open curve from the lower anteorbital to the posterior supraciliary; the four first smallest, and truly suborbitals; the three last being postorbitals by

their situation. Immediately in advance of the latter, are three or four more subequal, small plates, constituting an inner series of post-orbitals. There are four temporal shields: an upper elongated one, and three lower, subrhomboid, smaller than the former. The auricular aperture is small, subelliptical, simple: the tympanum being deeply seated. The upper labials are well developed, and seven in number; the five anterior, subquadrangular and subequal; the two posterior, largest and subrhomboid. The symphyseal is hemidiscoid, and larger than the rostral. The lower labials, of which five may be counted on either side, are narrow and elongated; the first and last much smaller than the rest. The anterior odd mental shield is transversely elongated; the first pair being contiguous, and smaller than the second pair, which is the largest, and diverges as well as the third and last pair.

The scales are proportionally large, for we count but twenty-six longitudinal series around the body. Of these, six belong to the dorsal region, properly so called; six also to the abdominal region, and seven to each side. As usual, the lateral scales are the smallest; the dorsal and abdominal ones, on the other hand, are subequal. The two middle preanal scales are somewhat larger than the rest. The caudal scales are larger than those of the body, subequal, except the inferior middle series, which is more developed transversely.

The limbs are short and weak, as well as the fingers and toes; the anterior pair extends about to the third of the distance towards the groins, and the posterior pair somewhat beyond the third of the distance towards the axillae: therefore, the two pairs do not meet when directed towards one another. When the anterior pair is brought forwards alongside the neck, the longest finger stretches beyond the ear, without, however, reaching the angle of the mouth. The palms and soles are coarsely tubercular, and the inferior aspect of the fingers protected by transverse, well-developed, smooth plates. The third and fourth fingers are nearly equal; the fourth toe is much the longest. The nails are short, compressed, acerated, and slightly curved.

The upper region is golden-green; the back and tail speckled with elongated small black spots, irregularly or rather obscurely disposed upon longitudinal series. A dark chestnut or black streak, obsoletely white-lined above, occupies each flank, from the ear to the base of the tail. The lower half of the sides is greyish, speckled with elongated, white and black spots. The upper aspect of the limbs, digits included,

and tail, is similarly black and white speckled. The throat and head beneath are densely speckled with black; the abdomen and under surface of the tail being unicolor, of a light yellowish hue. The labials exhibiting a saffron reflect.

Loc.—Bay of Islands, New Zealand. Brought to the exploring party on the 29th of February, 1840, when a colored sketch from life was made by Mr. Drayton.

Plate XXVI, fig. 9, represents *Cyclodina aenea*, size of life.
Fig. 10, the upper surface of the head;
Fig. 11, a profile; and,
Fig. 12, an under view of the same region.
Fig. 13, the left hand from above;
Fig. 14, the same hand from beneath.
Fig. 15, a group of dorsal scales;
Fig. 16, a group of abdominal scales.
Figs. 10–16 are somewhat magnified.

Genus HOMBRONIA, Girard.

Char. gen.—*Corpore subtetragonali et depresso; squamis modicis et striatis coöperto, quarum duae praeanales sunt reliquis majores. Capite depresso, subtriangulari. Scutis parietalibus duobus; scuto occipitali mediano sejuncto; latero-occipitalibus duobus. Nare in scuto uno; scutis supranasalibus nullis. Dentibus maxillaribus subconicis; palatinis nullis. Palpebra inferiori disco translucido praedita. Apertura auditoria simplici; tympano sat profunde sito. Membris debilibus, valde distantibus; in unoquoque membro quinque digitis inaequalibus, subtus scutellis transversis et carinatis praeditis; palmis et plantis granulosis. Cauda longa, sat robusta, subcylindrica, squamis subaequalibus coöperta.*

Gen. Char.—Body subtetragonal and depressed, protected by moderate and striated scales; the two preanal ones larger than the rest. Head depressed, subtriangular. Two parietal plates. A middle occipital, and two latero-occipitals. Nostril in one plate; no supranasals. Maxillary teeth subconical. Palate toothless. Lower eyelid with a transparent disk. Auricular aperture simple; tympanum rather deeply seated. Limbs weak, far apart; five fingers and five

toes, unequal, with transverse, carinated plates beneath; palms and soles granular. Tail long, stoutish, and subcylindrical, with subequal scales.

SYN.—*Hombronia*, GRD. in Proc. Acad. Nat. Sci. Philad. November, 1857.

OBSERV.—The genus which we here establish, is to include some small Saurians, Lygosoms-like in their general aspect, or rather diminutive Cyclodi, to which they bear close affinities. Its representatives appear to be confined to the Austral lands, whence the so far known species have been obtained.

Besides the two species brought home by the Exploring Expedition, there is a third, figured on Plate iv, fig. 1, of the Atlas accompanying the "Voyage au Pole Sud et dans l'Océanie, sur les corvettes l'Astrolabe et la Zèlée," under the command of Captain Dumont-d'Urville, and known as "*Lygosoma crassicaudum*, HOMBR. & JACQ." (*Hombronia crassicauda*, GRD.).—DUM. & A. DUM. Catal. méth. Rept. Mus. d'hist. nat. ii, 1851, 172.—From Australia.

Its very stout tail distinguishes it at once from those described below, though apparently more allied to *H. fasciolaris* than to *H. undosa*. Its thick and obtuse snout is quite peculiar to it, enabling us at once to distinguish it from its congeners.

1. HOMBRONIA UNDOSA, Grd.

(Plate XXVII, figs. 17–24.)

CHAR. SPEC.—*Squamarum octo et viginti seriebus longitudinalibus. Scuto rostrali elevato, subconico; scutis nasalibus et postfrontalibus separatis. Disco palpebrae inferioris translucido subcentrali. Apertura auditoria valde parva. Squamis caudalibus quam dorsualibus et abdominalibus multo majoribus. Cauda longa. Supra fusca; lateribus vitta obsoleta, obscure badia et undulata, ornatis: infra clariori, unicolori.*

SPEC. CHAR.—Twenty-eight longitudinal series of scales. Rostral plate elevated, subconical. Nasals and postfrontals separated. Transparent disk of lower eyelid subcentral. Auricular aperture very small. Caudal scales much larger than the dorsal and abdominal ones. Tail long. Brown above; sides with an obsolete, undulating streak of deep chestnut; beneath lighter, unicolor.

SYN.—*Hombronia undosa*, GRD. in Proc. Acad. Nat. Sci. Philad. November, 1857.

DESCR.—A specimen, four inches and three-fourths in total length, gives about two inches to the head and body, making the tail longer than the two former regions combined. The body and neck are subquadrangular and depressed; the body being broader than deep, and the neck deeper than broad. The head is depressed also, and subquadrangularly pyramidal. The tail is subconical, stoutish, tapering. The limbs are moderate; the anterior pair, when bent forwards, stretching a little beyond the auricular aperture.

The rostral plate is somewhat elevated, and subconical. The nasals, subtrapezoid in shape, are almost entirely lateral, giving an opportunity to the odd, subrhomboid prefrontal to come into contact with the rostral, and to occupy exclusively the internasal space. The postfrontals, individually smaller than the prefrontal, and like it subrhomboid, are likewise separated from each other by the anterior obtuse angle of the vertex plate. The latter is elongated, subpentagonal, lanceolated, its posterior acute angle engaging between the parietals, which are contiguous upon their middle and subconvex margin. The middle occipital is moderate, spear-shaped, equally engaged between the parietals in front and the latero-occipitals behind, so as to be entirely inclosed by these two pairs of plates. A small pair of postoccipitals may still be recognized from amongst the adjoining scales, contiguous upon the middle line of the occiput, hence diverging sideways, where they meet an elongated and moderate temporal shield, which extends to the orbital chain, adjoining, by its upper edge, the latero-occipital, and beneath a few subrhomboid, inferior temporal shields. There are five supraoculars; the second and third largest; the first nearly equal to the fourth; the fifth being the smallest; the latter is contiguous to the latero-occipital plate, together with a portion of the fourth; the rest of the fourth and the third altogether, are contiguous to the concave margin of the parietal, whose anterior angle manages to thrust itself as far as the second supraocular. The first and second supraoculars are contiguous to the vertex plate, which sends an angular projection to the outer series of supraoculars or supraciliaries, thus preventing the first supraocular to come into contact with the postfrontal. The supraciliaries are eight or nine in number, subquadrangular in shape, and diminishing in size posteriorly, and extend from the postfrontal to the posterior or fifth supraocular. A narrow, elevated postnasal

extends, obliquely inclined forwards, from the second upper labial to the lateral angle of the prefrontal, being contiguous behind to the postfrontal and the loral. The latter is contiguous above to the postfrontal and anterior supraciliary, below to the second upper labial, and posteriorly to a quadrangular anteorbital, a direct continuation of the infraorbital chain, and placed immediately beneath the anterior supraciliary. The transparent disk of the lower eyelid is elliptical and well developed. The upper labials are seven on either side; the fifth entering into the orbital chain, beneath the transparent space of the eyelid; the first is long and narrow, with the nasal resting entirely upon it; the four following are subquadrangular, increasing somewhat in size backwards; the sixth and seventh are subrhomboid. The symphyseal plate, broader than the rostral, is hemidiscoid or semilunate. The lower labials are very narrow and long, five on either side. The mental shields are broadly developed, three pairs and an odd one; the shields of the anterior pair contiguous; the others diverging.

The scales are striated under the epidermis, which is smooth; they are larger upon the abdomen than on the back, smallest upon the sides, and disposed upon twenty-eight longitudinal series, across the middle of the body; the two middle dorsal series are larger than the adjoining series, and a shallow groove may be seen between them. The caudal scales are conspicuously larger than the dorsal and abdominal ones.

The upper regions are brown, unicolor along the dorsal region, with an obsolete chestnut band composed of a series of small curves, convex backwards, situated along the upper portion of the flanks, from the upper edge of the orbit to a certain distance along the tail, and beneath it, transverse irregular fasciae or spots of the same chestnut hue. The inferior regions are of a very light brown, unicolor.

Loc.—Bay of Islands, New Zealand.

Plate XXVII, fig. 17, represents *Hombronia undosa*, size of life.
Fig. 18, the head, viewed from above;
Fig. 19, a profile view; and,—fig. 20, an under view of the same.
Fig. 21, the left hand, from above;—fig. 22, the same, from below.
Fig. 23, a group of dorsal scales.
Fig. 24, a group of abdominal scales.
Figs. 18–24, are somewhat magnified.

2. Hombronia fasciolaris, Grd.

(Plate XXVII, figs. 25–32.)

Char. spec.—*Seriebus squamarum longitudinalibus sex et viginti. Scuto rostrali depresso, hemidiscoide; scutis nasalibus valde distantibus, postfrontalibus fere contiguis. Disco pellucido palpebrae inferioris subcentrali. Apertura auditoria maxima. Squamis caudalibus et dorsualibus subaequalibus. Cauda longissima. Colore olivaceo-viridi; dorso punctato; lateribus superne vitta obscura ornatis, inferne aeque ac abdomine cinereo lineolatis.*

Spec. Char.—Twenty-six longitudinal series of scales. Rostral plate low, hemidiscoid. Nasals wide apart. Postfrontals nearly contiguous. Transparent disk of lower eyelid subcentral. Auricular aperture very large. Dorsal and caudal scales subequal. Tail very long. Greenish-olive; back speckled; upper part of sides with a dark streak; lower part and belly lineolated with greyish.

Syn.—*Hombronia fasciolaris*, Grd. in Proc. Acad. Nat. Sci. Philad. November, 1857.

Descr.—Compared to the preceding one, this species is of a much more slender appearance: the tail being proportionally much longer, since it measures three inches, whereas the body and head combined do not quite give an inch and three-fourths. The body is obtusely four-sided, and much more depressed, broader than deep, and so is the neck also. The tail itself is subconical, deeper than broad, and tapering into a more attenuated point. The head is a good deal shorter, and the auricular aperture much larger. The limbs are very slender, and not so far apart; the anterior pair, in being brought forwards, extends as far as the angles of the mouth, owing to its shorter neck.

The rostral plate is quite low and hemidiscoid. The nasals, subtrapezoid in shape, are mostly lateral; their anterior angle showing slightly in an upper view of the head: they are, however, widely kept apart by the odd, subrhomboid prefrontal, which is contiguous to the rostral, as in the former species. The postfrontals, smaller than the prefrontal, and irregularly rhomboid, approximate more closely toge-

ther, though not quite contiguous, since the anterior angle of the vertex plate meets the prefrontal. The vertex plate itself is elongated, lanceolated, very acute posteriorly, where it engages but slightly between the parietals. The odd occipital is a sublanceolated lozenge, entirely inclosed in front by the parietals, and behind by the latero-occipitals. The postoccipitals are subrhomboid, scale-like, as well as the temporal shields, of which three or four may be counted on either side. The supraoculars are likewise five in number; the second largest; the fifth very small, and contiguous to the lateral-occipital; a portion of the second, the third and fourth entirely, meet the parietal; the first and second are contiguous to the vertex plate, and the first, moreover, sends an acute angle to the postfrontals. The transparent disk of the lower eyelid is subcircular, of moderate development. Seven labials on either side may be observed; the fifth interrupting the infraorbital chain; the five anterior are subquadrangular, increasing somewhat in size backwards; the sixth and seventh are subrhomboid, resembling the temporal shields. The symphyseal is a little smaller than the rostral, and hemidiscoid. The lower labials, smaller than the upper, are six on either side; the first and sixth smallest. There are three pairs of broad mental shields, and an odd one in front; the anterior pair is contiguous upon the middle edge; the others are diverging.

The scales are disposed upon twenty-six longitudinal series across the middle of the body. The dorsal and caudal ones are subequal, and somewhat larger than on the sides. The caudal scales are slightly larger than those on the body, similar aspects being compared.

The dorsal region, head, and tail above are brownish-olive; the back speckled with black. A dark streak extends along the upper portion of the flanks, from the orbit to almost the very tip of the tail, somewhat obsolete along the latter region; it may also be traced, narrower, to the nostril in advance of the eye; along the flanks it is margined with a lighter fillet. The lower half of the sides and belly are light greenish-olive; the sides somewhat speckled or else lineolated, as well as beneath, with greyish: there being one of these lines between each row of scales. In the young, there is a conspicuous light line from the ear to the groin, margining the lower edge of the lateral dark streak. The upper light line is also more conspicuous than in the adult. Beneath the inferior light line, is another narrow dark streak.

Loc.—Bay of Islands, New Zealand.

Plate XXVII, fig. 25, represents *Hombronia fasciolaris*, size of life.
Fig. 26, an upper view of the head;
Fig. 27, the profile; and,
Fig. 28, an under view of the same region.
Fig. 29, the left hand, from above;
Fig. 30, the same hand, from beneath.
Fig. 31, a group of dorsal scales;
Fig. 32, a group of abdominal scales.
Figs. 26–32, are somewhat magnified.

Genus OLIGOSOMA, Girard.

Char. gen.—*Corpore subcylindrico, breviori, squamis modicis et striatis coöperto; duabus seriebus dorsualibus medianis majoribus. Capite subquadrangulo-pyramidali, depresso; naribus in lateribus sitis. Scutis supranasalibus nullis; parietalibus separatis. Dentibus palatinis nullis. Palpebra inferiori disco pellucido praedita. Apertura auditoria antice subdenticulata vel simplici; tympano plus minusve profundo. Membris modicis; digitis utriusque membri quinque inaequalibus; palmis plantisque subtiliter granulosis; scutellis subdigitalibus transversis, laevibus. Cauda longa, subcylindrica, et minuente.*

Gen. Char.—Body subcylindrical, rather short, covered with moderate and striated scales; two middle dorsal rows largest. Head subquadrangulo-pyramidal, depressed. Nostril lateral, in one plate; no supranasals. Parietals separated. Palate toothless. Lower eyelid with a transparent disk. Auricular aperture subdenticulated in front, or simple; tympanum more or less sunk. Limbs moderately developed; five fingers and five toes, unequal; palms and soles finely granulated; subdigital plates transverse, smooth. Tail long, subcylindrical, and tapering.

Syn.—*Oligosoma*, Grd. in Proc. Acad. Nat. Sci. Philad. November, 1857.

Observ.—This genus is intimately related to *Mocoa*, from which it differs chiefly by its less-developed limbs, and the separation of the parietal plates. The middle occipital is also distinct from either the parietals or the latero-occipitals.

1. Oligosoma zelandicum, Grd.

(Plate XXVII, figs. 9–16.)

Spec. Char.—Body rather short, covered with thirty longitudinal series of scales. Snout short. Auricular aperture moderate, slightly denticulated in front. Preanal scales larger than the adjoining series. Olivaceous-brown above, streaked with black; sides orange-red, with a yellow, and two black streaks. Light brown beneath, unicolor, except under the head.

Syn.—*Tiliqua moco*, Gray, MSS.
Lygosoma moco, Dum. & Bibr. Erpét. gén. V, 1839, 718.
Tiliqua zelandica, Gray, in *Dieff.* Trav. New Zeal. II, 1843, 202.
Mocoa zelandica, Gray, Catal. Lizz. Brit. Mus. 1845, 82; &, Zool. Ereb. & Terr. VI, 1845, 8.
Oligosoma moco, Grd. in Proc. Acad. Nat. Sci. Philad. November, 1857.

Descr.—The body is comparatively short, subcylindrical, broader than deep; the tail being once and a half as long as the body and head combined, subcylindrical, somewhat depressed at the base, slender, and tapering posteriorly into a point. The head is of medium size, depressed, rather broad behind, narrow upon the snout, which is subtruncated. The limbs are of moderate development; the anterior ones will nearly reach the orbit when brought forwards alongside the neck and head, and when similarly bent backwards, they will extend beyond the middle of the distance towards the groins; in bringing forwards the posterior pair, the extremities of the toes will reach the carpus, and the fingers the tarsus.

The nasal and postfrontal plates are separate; the prefrontal, subrhombic in shape, and broader than long, being contiguous in front to the rostral, behind to the vertex plate, and sideways to the postnasal. The vertex plate itself is elongated, anteriorly broad and angular, posteriorly spear-shaped, hence tapering. The parietals are also elongated, subcrescentic, slightly overlapped anteriorly by the vertex plate. The middle occipital is rather small and spear-shaped, like the vertex plate; its anterior angle engaging between the parietals. The latero-occipitals inclose entirely the middle one, being contiguous anteriorly to the parietal, the fourth supraocular, and the two

hind postorbitals, whilst laterally, they are bordered by the upper temporal shield, and posteriorly by the scales of the neck, the two adjoining ones of which being somewhat larger, simulating a pair of postoccipitals. The rostral is broad, and convex upon the periphery of the muzzle; its upper margin is rounded, and extends somewhat to the upper surface of the snout. The postnasal is deeper than long, slightly inclining forwards. The loral is larger and longer than deep, else subquadrangular. There are two small anteorbitals, subpyriform; the lower one somewhat larger than the upper; both pointing towards the orbit. A small suborbital may be seen upon the commissure between the fourth and fifth labials, and two very small supraorbitals at the anterior upper edge of the orbit, contiguous above and below to the anteorbitals. From the commissure between the fifth and sixth labials, to the posterior supraciliary, may be observed a curved chain of six small plates, constituting the infero-posterior rim of the orbit. As already alluded to, there are two small plates placed between the upper temporal shield and the latero-occipital, as a double series of postorbitals. The supraciliary chain is composed of seven subequal plates, whilst the supraoculars number but four, the second of which being the largest. The temporal shields, three in number, are: an upper, elongated one, largest, and two lower ones, subrhomboid, subequal, resting on the labial plates. The auricular aperture is of moderate development, provided anteriorly with a series of small, erect scales, seated within the rim. The upper labials number seven on either side; the fifth, constituting the inferior rim of the orbit, is longer than deep, and quadrangular; the four anterior being subequal and smaller; the first, somewhat more elongated and narrower, sending an angle to the postnasal; the sixth and seventh are subrhomboid, and the largest of the series. The symphyseal is broader, though not quite so deep as the rostral. The lower labials are seven on either side: the first is the smallest, and subtriangular; the second, third, and fourth are longer than deep; the rest being nearly as deep as long, and subequal. Three pairs of mental shields and an odd one are observed; the latter largest, transversely broad; the anterior pair contiguous; the remaining two pairs diverging and smaller.

The scales surrounding the body are disposed upon thirty longitudinal series, six of which belonging to the dorsal region, eight to each side, and eight to the abdominal region; they are subequal on each region; the two middle dorsal series alone being somewhat larger than

the adjoining ones. Smallest on the sides, the abdominal scales are larger than the dorsal ones. The preanal series are subequal. On the caudal region, the scales are somewhat larger than on the body, and likewise larger beneath than above.

The upper regions of the head, neck, back, and tail are olivaceous or fulvous-brown, with metallic reflections; the head being variously spotted or speckled with black, whilst the neck and back exhibit a median black streak, either simple or double, oftentimes interrupted, or else formed of one or two series of black spots, such as are observed along the tail. A similar black streak exists on each side of the back, extending from the supraocular region along the tail, exteriorly of which is a narrow light line, beginning at the supraciliary region, to terminate at the base of the tail. From the eye to the base of the tail is an orange-red (chestnut-brown in alcoholic specimens) streak, margined above and below with black, and from the upper labials is another narrow yellowish streak, crossing the ear, likewise margined with black, though the same black margin which lines beneath the orange-red streak, is the one which lines above the yellowish streak now spoken of. The lower portion of the sides of the head, neck, and flanks is either orange-red, unicolor, or else speckled with brown and white. The sides of the tail exhibit black and yellowish spots, the continuation of the lateral streaks. The limbs are similarly spotted with black and yellowish. Beneath, the hue is nearly uniform pale brown, black-speckled under the head, and obscurely lineolated longitudinally over the belly and along the tail.

Loc.—Specimens of this species were collected, about the Bay of Islands, New Zealand, during the earliest part of March, 1840, when a colored sketch was made from the living. It is said to be "common among stones along the shores of the bay, not being met with at all in the interior, even on exposed and barren hills." (Pickering.)

Plate XXVII, fig. 9, represents *Oligosoma zelandicum*, size of life.
Fig. 10, an upper view of the head;—fig. 11, the profile; and,
Fig. 12, an under view of the same region.
Fig. 13, the left hand, from above;—fig. 14, the same, from below.
Fig. 15, a group of dorsal scales;
Fig. 16, a group of abdominal scales.
Figs. 10–16, are somewhat magnified.

2. Oligosoma noctuum, Grd.

Spec. Char.—Body rather depressed, covered with twenty-six longitudinal series of scales. Snout subconical. Vertex plate spear-shaped, pointing posteriorly. Auricular aperture large and simple. Middle preanal scales largest. Bronzed, with a vertebral yellow streak, and two dorsal series of closely approximated black spots, and a lateral band of the same color, extending on the sides of the tail. Jaws transversely fasciated with deep brown. Belly fulvous.

Syn.—*Scincus noctua*, Less. Zool. Voy. Coq. II, 1, 1830, 48, Pl. III, fig. 4.
Oligosoma noctuum, Grd. in Proc. Acad. Nat. Sci. Philad. November, 1857.

Observ.—This species, though intimately allied to the preceding one, is easily distinguished from it by its larger scales, more elongated head, and pointed snout, more elongated and more slender vertex plate, larger auricular aperture, with its anterior edge simple, else not provided interiorly with erect scales. It appears also to be of lesser dimensions, for we have examined series of individuals of both species, all leading to that belief.

Descr.—The body is broader than deep. The tail, depressed at the base, subconical and tapering posteriorly, being somewhat longer than the body and head combined; the limbs having the same development as in *O. zelandicum*. The head is small and slender, tapering towards the snout, which is subconical. The rostral plate is elevated, convex, hemidiscoid. The nasals, subquadrangular or trapezoid, are lateral and widely separated. The prefrontal, subrhomboid, is narrowing anteriorly, and nearly as broad upon its middle as long. The postfrontals, small, are wide apart: hence, the prefrontal is contiguous anteriorly to the rostral and posteriorly to the vertex plate. The latter is very much elongated, spear-shaped, very much pointed posteriorly. The parietals are slender, anteriorly narrow and tapering, posteriorly rounded and broadest. The middle occipital is elongated and spear-shaped also, extending almost to the posterior edge of the latero-occipital plates, which are the largest of the cephalic set. The post-occipitals are scarcely to be distinguished from the adjoining scales. The temporal and loral regions present the same aspect in their shields

and plates as in the preceding species. We observe also seven upper labials on either side; the fifth enters likewise into the rim of the orbit, but is not as large as in *O. zelandicum;* they increase gradually in size backwards; the first is the smallest, all of them being quadrangular; the third, fourth, and fifth as deep as long; the sixth and seventh deeper than long. The lower labials are very narrow and elongated, six or seven in number, diminishing posteriorly, the middle ones being the largest, and the first very small. The symphyseal is hemidiscoid, nearly equal to the rostral or somewhat larger. The odd mental shield is large and lozenge-shaped; those of the first pair are subrhomboid, and contiguous upon the middle of the chin; the second pair is the largest, being transversely elongated, diverging as well as the third pair, which is almost as large as the first pair.

The scales which surround the body constitute twenty-six longitudinal series, four of which belonging to the dorsal region properly so to be called, eight to the abdominal region, and seven to each side. The dorsal scales are larger than the abdominal ones, which are larger than on the sides; the two middle dorsal series, moreover, are much larger than the adjoining series, and transversely elongated. The two middle preanal scales are conspicuously larger than the adjoining ones.

A yellowish-golden or whitish band extends from the occiput to the origin of the tail, flanked on either side by a series of closely approximated black spots, constituting sometimes a continuous streak, with undulating margins, at others, the spots are isolated. A bronze area extends from the supraocular region backwards, and immediately beneath, on the sides of the body, from the eye to a certain distance along the tail, is a black band, speckled with bronze or olive, and passing over the auricular aperture, the insertion of the arms and thighs. The lower portion of the sides is brownish, light-speckled. The upper surface of the head and limbs is brown, varied with blackish; the digits are transversely semi-annulated with black; the upper surface of the tail being brownish. The abdomen and tail beneath are either light brown or greyish, sometimes unicolor, at others, obsoletely streaked between each series of scales. The jaws are transversely fasciated, with deep brown or blackish upon the commissure of the labial plates, the centre of which retaining a light brown hue.

Loc.—Coral Islands. Common at Taheiti (Otaheiti) and Eimeo, Samoa, &c., under stones, near the margin of the water. Specimens

were also procured at Raraka, Sandwich Islands, and other localities, thus giving to this species a range almost as wide as that of *Emoa cyanura*, and like the latter, it is very likely carried from island to island by the natives, for it is most frequently seen about their huts.

Genus LYGOSOMELLA, Girard.

Char. gen.—*Corpore depresso, elongato, squamis modicis et striatis coöperto. Capite subquadrangulo-pyramidali, depresso. Naribus in lateribus sitis, scutum unum perforantibus. Scutis supranasalibus nullis; parietalibus separatis. Palato edentulo. Palpebra inferiori disco pellucido praedita. Apertura auditoria antice denticulata; tympano profundo. Membris parvis, valde distantibus; digitis utriusque membri quinque inaequalibus; palmis plantisque subtiliter tuberculosis; scutellis subdigitalibus transversis, laevibus. Cauda modica, subconica, minuente.*

Gen. Char.—Body depressed, elongated, covered with moderate and striated scales. Head subquadrangulo-pyramidal, depressed. Nostrils lateral, in one plate; no supranasal plates. Parietal plates separated. Palate toothless. Lower eyelid with a transparent disk. Auricular aperture denticulated in front; tympanum deeply seated. Limbs small, far apart; five fingers and five toes, unequal; palms and soles finely tubercular. Subdigital plates transverse, smooth. Tail moderate, subconical, and tapering.

Syn.—*Lygosomella*, Grd. in Proc. Acad. Nat. Sci. Philad. November, 1857.

Observ.—Like the preceding, this genus is a dismemberment of *Mocoa*, remarkable for its depressed body, weak and distant limbs. The parietal plates are not united, and the middle occipital exists as a distinct plate.

Lygosomella aestuosa, Grd.

(Plate XXVII, figs. 1–8.)

Char. spec.—*Corpore longiori, triginta sex seriebus squamarum longitudinalibus coöperto. Rostro elongato. Scuto labiali superiore quinto*

in orbitam producto. Apertura auditoria parva, antice subdenticulata. Scutellis praeanalibus subaequalibus. Colore fusco-olivaceo, cum vitta pallida nigro marginata ad partem lateris superiorem. Dorso et lateribus albo nigroque punctatis; abdomine unicolori; gula mentoque nigro punctatis.

Spec. Char.—Body rather long, protected by thirty-six longitudinal series of scales. Snout elongated. Fifth upper labial entering into the orbit. Auricular aperture small, slightly denticulated in front. Preanal scales subequal. Olivaceous-brown, with a pale streak, margined with black, situated along the upper portion of the flanks. Dorsal region and sides somewhat speckled with black and white. Abdomen unicolor. Throat and chin speckled with black.

Syn.—*Lygosomella aestuosa*, Grd. in Proc. Acad. Nat. Sci. Philad. November, 1857.

Descr.—The body is comparatively elongated, subcylindrical, much broader than deep; the tail being but a little longer than the body and head combined, subcylindrical, somewhat depressed at the base, stoutish, and tapering posteriorly. The head is well developed, depressed, elongated, subquadrangularly conical. The limbs are small; the anterior ones will reach the orbit when brought forwards, and when bent backwards they will extend a little beyond the third of the distance to the groins. In bringing forwards the posterior pair, the extremities of the toes will extend midway to the axillae, so that neither the fingers nor the toes would meet on the sides of the body if directed towards one another. The fingers and toes themselves are of moderate length, unequal.

The nasal plates approximate one another without coming into contact. The prefrontal is lozenge-shaped, as long as broad; the postfrontals being small, and more widely apart than the nasals. The vertex plate is elongated, broad, anteriorly angular, tapering and spear-shaped posteriorly, where it overlaps slightly the parietals, as in *O. zelandicum*. The parietals themselves are subrhomboid, broad behind, contiguous anteriorly to the second, and sideways to the third and fourth supraoculars. The symphyseal, which is larger than the rostral, is hemidiscoid in shape, the lower labials being seven in number. The transparent disk of the lower eyelid is elliptical and central. The auricular aperture is small, and the tympanum rather sunk, some-

times invisible, provided anteriorly with very small erect scales, seated rather inwardly, so that on a superficial examination their presence might easily be overlooked.

The scales which surround the body are rather small, for we count thirty-six longitudinal series of them: six series along the dorsal region, properly so called, ten on either sides, and ten abdominal series. The lateral scales are the smallest; the abdominal ones the largest. They are subequal over each region, with the exception of the dorsal region, where the two middle series are slightly larger than the adjoining series. The preanal scales are subequal also. On the tail, they are somewhat larger than on the body, and nearly equal all around.

This species having been sketched from life by the skilful brush of Jos. Drayton, its coloration has thus been preserved for our inspection. The upper regions are of an olivaceous-brown hue, without metallic reflections. A light-brown streak, speckled with black, extends from the eye to a certain distance along the tail, being at the same time margined above and below with black, either in a continuous or interrupted line. The dorsal region is speckled with black, and occasionally exhibits a median line of the same color. The sides are bluish-grey, speckled with black and white. The limbs and tail above are olive-brown also, and similarly sprinkled over with black. Beneath, the hue is greyish, minutely dotted with black, more so sideways than upon the middle region: the throat more densely so than the abdomen and tail.

Loc.—Bay of Islands, New Zealand. March, 1840. "Associated with the preceding (*Oligosoma zelandicum*), and also common on the beaches more exposed to the surf." [Pickering.]

Plate XXVII, fig. 1, represents *Lygosomella aestuosa*, size of life.
Fig. 2, is an upper view of the head;
Fig. 3, a profile; and,
Fig. 4, an under view of the same region.
Fig. 5, the left hand, from above;
Fig. 6, the same hand, from beneath.
Fig. 7, a group of dorsal scales;
Fig. 8, a group of abdominal scales.
Figs. 2–8, are somewhat magnified.

Genus LIPINIA, Gray.

Gen. Char.—Body subfusiform or subquadrangular, covered with well-developed and perfectly smooth, and subequal scales. Head depressed, declivous towards the snout. No supranasal plates; nostrils lateral, each in one plate. Vertex plate elongated, narrow, tapering posteriorly. A pair of parietals. Middle occipital distinct from either the parietals or the latero-occipitals. Palate toothless. Tongue nicked at the extremity. Eye moderate; lower eyelid with a transparent disk. Auricular aperture large, subcircular, simple; tympanum somewhat sunk, though visible. Limbs four, slender, and distant; palms and soles tuberculated; fingers and toes unequal, very small, slender, compressed, and clawed. Tail elongated and tapering.

Syn.—*Lipinia*, Gray, Catal. Lizz. Brit. Mus. 1845, 84.

Observ.—Whether the species which we describe below is truly congeneric with *Lipinia pulchella*, Gray, we are not prepared to decide for the present, since no description of the latter has as yet been furnished.

The present genus, as here characterized, differs from *Oligosoma*, to which it bears strong affinities, in the dorsal scales not being larger on the two middle series, the weaker and more distant limbs, the exiguous fingers and toes, and the coarsely granular or rather tubercular structure of the palms and soles.

Moreover, its scales are perfectly smooth, a character which will distinguish *Lipinia* from both, *Oligosoma* and *Lygosomella*. In the latter, the limbs are much wider apart, and the fingers and toes more developed than in *Lipinia*. The tubercles over the palms and soles are also less developed in *Lygosomella* than in the genus here referred to.

Lipinia vulcania, Grd.

Char. spec.—*Squamis in triginta series longitudinales circum corpus dispositis. Scuto praefrontali magno, subquadrangulari; scutis post-*

frontalibus contiguis; supraocularibus amplissimis; loreis duobus, tenuibus, ad verticem versus elongatis; temporalibus squamiformibus. Supra fusca, cum vitta laterali subnigra; infra unicolori.

Spec. Char.—Scales disposed upon thirty longitudinal series around the body. Prefrontal plate large, subquadrangular; postfrontals contiguous; supraoculars quite large. Two slender, vertically elongated lorals. Temporal shields scale-like. Brown above, with a lateral darker streak; beneath unicolor.

Syn.—*Lipinia vulcania*, Grd. in Proc. Acad. Nat. Sci. Philad. November, 1857.

Observ.—From the information we possess regarding *Lipinia pulchella*, Gray (Catal. Lizz. Brit. Mus. 1845, 84), we are not prepared to draw any comparative specific characters between the latter and the species which we describe further on, beyond their system of coloration, which, however, is quite peculiar in both. We hope some one will take the opportunity of looking carefully into this subject, and furnish us with an accurate description of the zoological traits of the species from the specimens preserved in the British Museum.

Descr.—The head is depressed, subconcave upon the interocular region; the snout being short and subacute, and quite declivous. The eye is large. The rostral plate is well developed, transversely elongated, maintaining its width sideways, where it is nearly as deep as upon the middle line of the snout. The prefrontal is quite large, subquadrangular in shape, occupying the entire fronto-rostral space. The postfrontals are subrhomboid, contiguous upon the middle line of the head. The vertex plate is quite elongated, sublanceolated, obtuse-angled anteriorly, and tapering posteriorly into an acute angle, extending somewhat beyond the middle of the supraocular region. Immediately behind the vertex plate, and in contiguity with it, are observed the subtrapezoid parietals, contiguous upon their inner margin. The middle occipital is moderate-sized, spear-shaped; its anterior rather obtuse angle engaging somewhat between the diverging parietals, whilst laterally it is entirely inclosed by the latero-occipitals, the posterior extremity of which, just approximating near the apex of the plate we are now alluding to. As to the latero-occipitals themselves, they are larger than the parietals, being next in size to the vertex

plate; they are quite elongated, exteriorly rounded, linear upon their contiguity with the middle occipital, and angular anteriorly, where they come into contact with the supraoculars and the parietals. The temples are protected by scales similar to those of the upper region of the neck, mayhap somewhat larger; the uppermost, lining the latero-occipital, might be termed a shield, from its stronger resemblance to the cephalic plates than to ordinary scales. The supraocular plates are very large, four in number; the two middle ones transversely elongated; the other two, subtriangular. Two very small plates, one at the anterior, the other at the posterior extremity of the supraocular region, might be regarded as supraocular plates also, from the fact of their exhibiting most of their surface in an upper view of the head: still, the anteocular could, with some propriety, be considered as an anteorbital, and the postocular, as a postorbital. Be this as it may, the anterior rim of the eye is formed by two subequal anteorbitals, situated beneath the anteocular just referred to, and the posterior rim, by three of the temporal scales in addition to the postocular. The inferior rim of the orbit is formed by the third, fourth, and fifth upper labials; the inferior postorbital resting upon the commissure between the fifth and sixth labials, and the inferior anteorbital upon a portion of the second upper labial. Two, vertically elongated, rather slender, and subequal lorals may be observed between the anteorbitals and the nasal plate; both resting upon the second upper labial, superiorly contiguous: the foremost to the prefrontal, and the hindmost, to the postfrontal. The nasal plate itself is subrhomboid, resting upon the first upper labial, hence, limited anteriorly by the rostral, and superiorly by the prefrontal: the nostril perforates it upon its middle. There are six upper labials, increasing in size posteriorly; the first and second being quite narrow and elongated; the rest are deeper, and irregularly angular. The symphyseal is hemidiscoid, and somewhat larger than the rostral; it is followed, on either side, by four well-developed lower labials, longer than deep, diminishing in size backwards; one or two exiguous ones may be observed at the angle of the mouth, though not easily distinguished from the adjoining scales. There are five mental shields of considerable development: an anterior odd one, followed by two pairs, contiguous upon the middle line of the chin. A small scale may sometimes interpose between the commissure of the posterior pair. A third pair of mental shields might, perhaps, be distinguished from the scales of the throat, in being

rather larger than the latter. The auricular aperture is large, subcircular, and simple.

The body is subquadrangular, rather depressed, separated from the head by a somewhat contracted neck. The tail is depressed at the base, conical, and tapering posteriorly into a point; it is equal in length to the body and head combined. The limbs are slender and rather weak; when the anterior pair is bent backwards, and the posterior pair forwards, the tips of the fingers and toes barely meet; again, the anterior pair, in being brought forwards, scarcely extends beyond the anterior edge of the auricular aperture. The fingers and toes themselves are unequal, very slender, and clawed; protected beneath by large, transverse plates, whilst the palms and soles are coarsely granular or tubercular.

The scales which protect the body are proportionally well developed, and disposed upon thirty longitudinal series around the middle of the body. They are subequal, somewhat smaller on the flanks than on the back and belly, and smaller still on the sides of the neck than on the flanks. The two middle preanal scales are a good deal larger than the adjoining ones upon the interfemoral region; they are subequal also around the tail, and apparently smaller than on the back and belly, though they are, in fact, equal sized, but instead of being subrhomboid, and posteriorly rounded, they assume a more elongated or sublanceolated shape, being rather acute posteriorly. The scales which cover the limbs are much smaller than those on the flanks.

The color of the dorsal region is light brown, spread over with darker specks; the head being unicolor. A lateral dark brown streak, interrupted or speckled with whitish or yellowish, extends from the eye to a certain distance along the tail; the side of the head is mottled with light and dark brown, as also the lower half of the flank. The inferior regions are light brown, unicolor.

Loc.—Caldera, on Mindanao, Philippine Archipelago.

Genus HINULIA, Gray.

Gen. Char.—The body is subcylindrical, rounded, covered with perfectly smooth scales. The two middle dorsal rows larger than the rest, and the two middle preanal scales also much larger than the

adjoining ones. The head is subconical. The maxillary teeth short and subconical. The palate toothless. The eye is moderate; the lower lid being scaly. The auricular aperture either simple or denticulated in front; tympanum rather sunk. The limbs are moderate; the fingers and toes five, unequal and compressed. Tail long, subconical, and tapering.

Syn.—*Hinulia*, Gray, Catal. Lizz. Brit. Mus. 1845, 74; &, Zool. Ereb. & Terr. vi, 1845, 6.

Observ.—The species which follows being the only one directly examined by us, we have not been able to make a thorough study of the present genus. It strikes us as though composed of heterogeneous elements, neither sufficiently investigated in themselves nor judiciously compared to one another.

Hinulia taeniolata, Gray.

Spec. Char.—Nasal plates contiguous. Postfrontals separated. Fifth upper labial large, quadrangular, situated under the pupil. Auricular aperture large, denticulated in front; tympanum rather sunk. Twenty-six longitudinal rows of scales around the body. Above brown or black, with eight white lines extending from the head to the base of the tail. Tail light brown, with three black streaks. Beneath whitish, unicolor.

Syn.—*Lacerta taeniolata*, Shaw, in *White*, Journ. Voy. N. S. Wales, 1790, 245, Pl. xxxii; &, Gen. Zool. III, i, 1802, 239.

Scincus octolineatus, Daud. Hist. nat. Rept. IV, 1802, 285.

Scincus taeniolatus, Merr. Tent. Syst. Amph. 1820, 72.

Scincus undecimstriatus, Kuhl, Beytr. Zool. und Vergl. Anat. 1820, 129.

Scincus multilineatus, Less. Voy. de la Coq. Zool. II, i, 1830, 45, Pl. iii, fig. 2.

Tiliqua taeniolata, Gray, Synops. Rept. in *Griff.* Anim. Kingd. IX, 1831, 68; &, Ann. Nat. Hist. II, 1839, 289.

Lygosoma taeniolata, Dum. & Bibr. Erpét. gén. V, 1839, 734.

Hinulia taeniolata, Gray, Catal. Lizz. Brit. Mus. 1845, 78; &, Zool. Ereb. & Terr. vi, 1845, 7.

Le scinque à dix raies, Lacep. in Ann. Mus. d'hist. nat. IV, 1804, 192 & 208.

Keneux de Lesueur, Coct. Tab. synopt. Scinc. (Compt. rend. Acad. des Sc. IV, 1837.)

Descr.—A small, slender, graceful, and quite handsome species: the specimen before us measuring about five inches in total length.

Although the head is somewhat depressed, the snout is thickish, obtusely conical, protruding slightly beyond the lower jaw. The rostral plate is elevated, subtriangular, pointing upwards, and extending to the upper aspect of the head. The nasal plates are large, contiguous upon the middle line of the snout, subtrapezoid in shape, longest in the transverse sense of the head: the nostrils occupying their antero-inferior portion. The odd prefrontal, broader than long, would be hexagonal if its posterior margin were angular, instead of being rounded; it is contiguous in front to the nasals, sideways to the postnasals (or anterior lorals, should they so be designated), and behind to the postfrontals and the vertex plate. The latter is quite long, broad, and triangular anteriorly, narrow and tapering towards the parietals, which are rather small, subangular, and narrowest in front. The odd occipital is very small, slender, elongated, arrow-shaped, pointed posteriorly. The latero-occipitals are broad and well developed, inclosing completely the middle occipital, contiguous sideways to the upper temporal shield, and in front to the supraoculars. There are three well-marked temporal shields; two lower ones, subrhomboid, resting upon the labials, and an upper one, larger, subtriangular in shape. The supraoculars are five in number; the third being the largest; the first, which is the smallest, might be considered by others as belonging to the supraciliary chain. We observe six in the latter series; the anterior two largest; the posterior one equal to the second; the third, fourth, and fifth very small. The posterior rim of the orbit is formed by five small subequal plates, extending from the commissure between the fifth and sixth labials to the supraciliary chain. A double series of postorbitals, composed each of two small plates, may be observed superiorly, in advance of the uppermost temporal shield and exterior angle of the latero-occipital. The anterior rim of the orbit is formed by three plates: an inferior one, situated upon the commissure between the fourth and fifth labials, a middle one, the largest, quadrangular like the first, and a very small triangular one, contiguous above to the first supraocular. A well-developed, pentagonal loral is next met with, immediately in advance of the middle anteorbital, being contiguous superiorly to the postfrontal and first supraocular. A rather narrow, though elevated postnasal (or anterior loral, it matters not), extends from the second labial to the prefrontal. The upper labials are seven on either side; the four anterior subquadrangular, subequal, deeper than long; the fifth subtrapezoid, longer than

deep, and constituting the inferior rim of the orbit; the sixth and seventh subrhomboid, and as large as the fifth. The symphyseal, somewhat smaller than the rostral, is hemidiscoid. The lower labials, six on either side, are unequal; the two anterior small and quadrangular; the third, fourth, and fifth elongated and larger; the seventh diminutive or exiguous, hardly visible when the mouth is closed. A very large, odd mental shield occupies the transverse area of the chin, between the anterior two labials. It is followed by four pairs; the anterior pair largest, and contiguous upon the middle line of the chin; the remaining diminishing in size, and diverging posteriorly. The auricular aperture is large, subelliptical, provided anteriorly with three or four projecting scales, giving that edge a denticulated appearance. The tympanum is rather deeply seated.

The scales are perfectly smooth and shining: twenty-six longitudinal series may be counted as surrounding the body: four dorsal series, the two middle ones considerably larger; fourteen lateral series (seven on each side), smaller, and eight abdominal series, somewhat larger than on the sides. The two middle preanal scales are considerably developed. The tail is tapering and pointed, much longer than the body and head combined; it is protected by larger scales than the back and belly, and on the middle inferior row, they are much more developed still, being transversely elongated, simulating true scutellae. The fingers and toes are very slender, compressed and unequal, especially the toes, the fourth of which is quite long.

We pass over the coloration, which is very well described by our predecessors.

Loc.—Pewen Bewen, Southeastern Australia.

Genus MABUYA, Fitz.

Gen. Char.—Body subfusiform, rather depressed, of moderate length, covered with smooth, though striated scales. Head subquadrangulo-conical. Parietal plates separated. Nostrils lateral; supranasals extant. Lower eyelid with a transparent disk. Auricular aperture simple. Palate toothless. Limbs moderate; five fingers and five toes, unequal; palms and soles finely granulated. Under aspect of digits protected by smooth, convex plates. Preanal scales subequal. Tail conical and tapering.

Syn.—*Mabuya*, Fitz. Neue Class. Rept. 1826, 23 & 52.
Mabouya, Gray, Catal. Lizz. Brit. Mus. 1845, 93.

Observ.—The genus *Mabuya*, as understood here, is a purely American type, peculiar to the tropical and subtropical regions, for, we have separated, under a peculiar appellation (*Emoa*), such species of the islands of the Pacific as were included in it by other writers. As to *Mabuya elegans*, a native of India, we leave it out of the question until we shall have made a comparative study of its generic characters.

Mabuya agilis, Fitz.

Spec. Char.—Scales well developed, disposed upon thirty longitudinal series. Supranasals nearly contiguous upon the middle line of the rostrum. Postfrontals separated. Parietals smaller than the latero-occipitals. Middle occipital well developed; a pair of narrow postoccipitals. Second supraocular very large. Temporal shields small, scale-like. Upper labials eight; seventh much larger than the rest, and situated under the eye. Lower labials eight also, subequal, narrow. Mental shields transversely elongated. Auricular aperture moderate, slightly overlapped above by the adjoining scales, otherwise simple. Back bronzed, black-dotted; on each side, a broad black band, margined with white.

Syn.—*Scincus agilis*, Raddi, Mem. matem. e fisic. Soc. Ital. XIX, 18 . . , 62.
Mabuya agilis, Fitz. Neue Class. Rept. 1826, 52.
Scincus bistriatus, Spix, Spec. nov. Lacert. Bras. 1825, 23. Tab. xxvi, fig. 1.—Cuv. Règn. Anim. 2d ed. II, 1829, 63.—Griff. Anim. Kingd. IX, 1831, 158.
Scincus nigropunctatus, Spix, Spec. nov. Lacert. Brasil. 1825, 24. Tab. xxvi, fig. 2.
Euprepis bistriatus, Wagl. Naturl. Syst. Amph. 1830, 162.
Tiliqua nigropunctata, Gray, Synops. Rept. in *Griff.* Anim. Kingd. IX, 1831, 69.
Tiliqua albolabris, Gray, Ann. Nat. Hist. II, 1839, 292.
Tiliqua spixii, Cocт. Tab. synopt. Scincoid. (Compt. rend. Acad. des Sc. IV, 1837.)
Eumeces spixii, Dum. & Bibr. Erpét. gén. V, 1839, 642.
Mabouya agilis, Gray, Catal. Lizz. Brit. Mus. 1845, 94.

Observ.—We will not dwell upon the peculiar characters of this species, since it is the only one of its genus now at our command: hence, unable to speak of it comparatively. The Exploring Expe-

dition, moreover, brought home but one single specimen, not exceeding five inches in total length, and therefore, immature.

There is a feature amongst some of the plates on the sides of the head which, not having been dwelt upon by other writers, we deem it imperative to say a few words. We allude to the upper labials and suborbitals: the upper labials being eight in number, the anterior six constitute, as it were, a series by themselves, largest in the middle, diminishing anteriorly and posteriorly, the sixth engaging under the seventh; the latter is much larger than the rest, elongated, occupying almost the entire suborbital region, forming the lower rim of the orbit, projecting over the sixth, and constituting a separate series with two or three small suborbitals, and a moderate anteorbital, all convex, raised into a kind of ridge from the seventh labial to the loral region. Now, on the loral region, between the orbit and the nasal, we observe but two plates: the anteorbital, just alluded to, and another, which may either be considered as a postnasal or a loral, properly so called. The lower labials are narrow, longer than deep, subequal, except the first, which is very small and subquadrangular; the posterior one is likewise smaller than those in the middle of the series. The symphyseal is larger than the rostral. The mental shields, the anterior odd one as well as the three following pairs, are well developed, subquadrangular, transversely elongated; the shields of the anterior pair being contiguous upon the middle line of the chin.

Loc.—Rio de Janeiro, Brazil.

Genus EMOA, Girard.

Char. gen.—*Corpore elongato, subfusiforme, plus minusve depresso, squamis laevibus quamvis substriatis coöperto. Capite subquadrangulo-pyramidali; scutis supranasalibus duobus; parietalibus, cum quibus scutum occipitale medianum interdum est conjunctum, in unum coalescentibus; postoccipitalibus duobus. Dentibus maxillaribus brevioribus et subconicis; palatinis nullis. Palpebra inferiori disco pellucido praedita. Apertura auditoria denticulata vel simplici; tympano profunde sito. Membris sat robustis; palmis plantisque granulosis; digitis utriusque membri quinque, compressis, inaequalibus, uncinatis; scutellis subdigitalibus numerosis, laevibus. Cauda elongata, minuente.*

GEN. CHAR.—Body elongated, subfusiform, more or less depressed, covered with smooth, though substriated scales. The head is subquadrangulo-pyramidal. A pair of supranasal plates. Parietals united into one. Middle occipital sometimes combined with the united parietals. A pair of postoccipitals. Maxillary teeth rather short and subconical. Palate toothless. Lower eyelid with a transparent disk. Auricular aperture denticulated or simple; tympanum deeply seated. Limbs well developed; palms and soles granular; fingers and toes five in number, compressed, unequal, clawed. Subdigital plates numerous and smooth. Tail elongated, tapering.

SYN.—*Emoa*, GRD. in Proc. Acad. Nat. Sci. Philad. November, 1857.
Emo, in the language of the natives of the Pacific Islands.

OBSERV.—In addition to the four species enumerated further on, this genus will include several others, specimens of which are not contained in the collection made by the Exploring Expedition; they are the following:

1. EMOA CARTERETI.—*Eumeces carteretii*, DUM. & BIBR. Erpét. gén. V, 1839, 651.—*Mabouya carteretii*, GRAY, Catal. Lizz. Brit. Mus. 1845, 95.
LOC.—New Zealand.

2. EMOA BAUDINI.—*Eumeces baudinii*, DUM. & BIBR. Erpét. gén. V, 1839, 653.—*Mabouya baudinii*, GRAY, Catal. Lizz. Brit. Mus. 1845, 95.
LOC.—New Guinea.

3. EMOA HIEROGLYPHICA.—*Lygosoma hieroglyphicum*, HOMBR. & JACQ. Voy. au Pole Sud et dans l'Océanie, Pl. V, fig. 1.—DUM. & A. DUM. Catal. méth. Rept. Mus. d'hist. nat. ii, 1851, 166.
LOC.—Van Diemen's Land.

Emoa baudini appears more closely related to *E. cyanura* than to any of the other species, inasmuch as the middle occipital plate is combined with the united parietals.

Emoa hieroglyphica exhibits characters intermediate between *E. samoensis* and *E. nigrita*.

One feature is striking: in all the species of this genus, there is a proclivity on the part of the parietals to unite into one plate, and also to combine with the odd or middle occipital.

And then again, the genus is exclusively pelagic: all the species belonging to the various islands of the Pacific Ocean.

1. Emoa atrocostata, Grd.

Spec. Char.—Body slender, rather depressed. Scales small, disposed upon fifty-six longitudinal series. Postfrontals separated. Middle occipital plate distinct. Auricular aperture moderate, subcircular, provided anteriorly with one or two erect scales. Tail subcylindrical, somewhat compressed. Above bronzed, spotted with black; sides black, speckled with white. Beneath unicolor, occasionally of a soiled hue.

Syn.—*Scincus atrocostatus*, Less. Voy. Coq. Zool. II, 1, 1830, 50, Pl. IV, fig. 3.
Tiliqua freycinetii, Coct. Tab. synopt. Scincoid. (Compt. rend. Acad. des Sc. IV, 1837.)
Eumeces freycinetii, Dum. & Bibr. Erpét. gén. V, 1839, 648.
Mabouya atrocostatus, Gray, Catal. Lizz. Brit. Mus. 1845, 95.

Descr.—The body is slender, and quite depressed, broader than deep, covered with rather small scales, compared to those of the other species, hence, the longitudinal series which they constitute are much more numerous. We observe about fifty-six of them: ten or twelve on the dorsal region, and fourteen or sixteen on the abdominal region. Larger on the tail, they are subequal above and on the sides, whilst the middle inferior series are transversely elongated, and much larger than all the rest. The preanal series is larger than the adjoining ones. The tail itself is but a little longer than the body and head combined, subconical, posteriorly compressed, and, as usual, tapering. The fore limbs, when stretched forwards, extend as far as the anterior rim of the orbit; the hind ones do not reach to the axillae, and the two pairs cross each other for about the length of the carpus and tarsus. The granulation of the palms and soles is rather coarse, and the plates beneath the digits rather broad.

The head is depressed, wedge-shaped, anteriorly narrow. The postfrontal plates are kept apart by the contiguity of the vertex plate with the prefrontal. The supranasals are well developed, and widely separated also. The auricular aperture is proportionally larger than in the two following species; its anterior margin exhibiting one well-developed, and two very small, erect scales.

The color above is either bronze or greenish-olive, speckled with black and whitish; the sides being made black by an interrupted streak of

that color, in the midst of which, may be seen elongated whitish spots. The limbs and tail are variegated with black and olive. Beneath unicolor, bluish, else of a soiled white.

Loc.—Feejee Archipelago. "Seems to keep mostly on the ground, among stones." [Pickering.]

2. Emoa samoensis, Grd.

Spec. Char.—Body stoutish, rather deep. Scales moderate, constituting thirty-two or four longitudinal series. Postfrontal plates contiguous. Middle occipital distinct. Auricular aperture moderate, with three small erect scales at the anterior margin. Four middle preanal scales, largest. Tail subconical and long. Olivaceous above, maculated with black; beneath unicolor and lighter.

Syn.—*Eumeces samoensis*, Hombr. & Jacq. Voy. au Pole Sud et dans l'Océanie. Pl. v, fig. 2.—Dum. & A. Dum. Catal. méth. Rept. Mus. d'hist. nat. ii, 1851, 157.
Emoa samoensis, Grd. in Proc. Acad. Nat. Sci. Philad. November, 1857.

Descr.—The head is of moderate development, very much depressed, slender, elongated, pointed towards the snout, which is subconical. The rostral plate is large, depressed, owing to the declivous snout; very convex, almost protruding, though the jaws be even. The nostrils perforate about the middle of a single plate, situated upon the side of the snout. An elongated supra- or internasal, lies almost horizontally over the nasal plate; it is broadest anteriorly, where it is contiguous to the rostral; tapering posteriorly, where it meets the postnasal. The prefrontal is large, subrhomboid, almost as broad as long, contiguous anteriorly to the rostral, thus keeping the nasals, as well as the internasals, widely apart. The postfrontals are rather large, sublozenge-shaped, contiguous upon the middle of the snout, thus preventing the vertex plate from coming into contact with the prefrontal. The vertex plate is moderate, elongated, subpentagonal, broadest anteriorly; its anterior angle engaging between the postfrontals. The parietal is unique, broadest posteriorly, slightly notched at the summit to admit the anterior and broadest extremity of the middle occipital, which is quite small and spear-shaped. The latero-occipitals are well developed,

inclosing posteriorly the middle occipital, and contiguous anteriorly to the parietal, the fourth supraocular, and the two upper postorbitals; laterally to the upper temporal shield, and posteriorly to the post-occipitals, of which there is a contiguous pair, moderately developed, meeting anteriorly the upper temporal shield. There are four well-developed and subequal supraocular plates, differing in shape, though subequal as regards the area which they cover. The anterior supraciliary might occasionally be taken for a fifth small supraocular: then the supraciliaries would number six only, all of which rather small; the posterior one being much more elongated than the middle ones, since it extends along the whole margin of the last supraocular. The postnasal (anterior loral) is elongated, subtrapezoid, narrowest posteriorly, contiguous above to the prefrontal and postfrontal, and beneath to the second labial. The loral is likewise subtrapezoid, narrowest anteriorly, where it meets the postnasal, and, as a whole, somewhat more developed than the latter; it is contiguous above to the postfrontal and anterior supraocular, and resting upon the third labial. There are three anteorbitals; the lower one being the smallest and triangular, resting upon the fifth labial; the upper one acutely triangular, but slightly larger, and situated under the first supraocular, whilst the middle one is subquadrangular and well developed, though a small portion only enters into the orbit, resting, as it does, upon the fourth labial, and thus occupying a portion of the loral region. We observe no supralabial plates: the sixth and seventh upper labials constituting the inferior rim of the orbit. There are five or six very small postorbitals, irregularly disposed upon a series, and two somewhat larger, immediately behind the former, and, as already observed, contiguous to the latero-occipital plate. The surface of the eyelid is granular, and the ciliary edge provided with numerous small plates. The transparent disk of the lower eyelid is subcentral and elliptical. Five or six temporal shields may be distinguished from the adjoining scales: an upper, elongated one, contiguous to the latero-occipital. The auricular aperture is moderate, subcircular, provided anteriorly with one well-developed, and two small, erect scales. The tympanum is deeply seated. The upper labials are eight in number; the two anterior rather narrow and elongated; the three following ones, subquadrangular, increasing gradually in size to the sixth, which is the largest, and longer than deep; the seventh and eighth are the next in size, and nearly as deep as long. The

symphyseal is hemidiscoid, and as large as the rostral. The lower labials are but five or six, narrow, longer than deep; the first quite small; the rest increasing in size to the fifth and sixth, which is sometimes smaller than the preceding ones. The odd mental shield is much larger than the symphyseal; the next pair is contiguous, and still well developed; the next two pairs diverge as well as diminish in size.

The body is subfusiform, rounded upon the sides and back, which are convex, whilst the abdominal region is quite flattened; it is covered with smooth, though striated scales, disposed upon thirty-two or thirty-four longitudinal series, six of which belonging to the dorsal region, ten to each side, and six or eight to the abdominal region. The two middle dorsal series are the largest; the adjoining two series being nearly equal to the abdominals, whilst the lateral ones are the smallest. The preanal scales are somewhat larger than the adjoining series, unequal: the middle one being the broadest. The tail is elongated and tapering, depressed at the base, subconical posteriorly. Not being entire upon the unique adult specimen before us, we cannot compare its absolute length to that of the body and head combined. A young individual has it very long, very slender, once and a half the length of the body and head together. Its scales, sideways, are subequal; the upper and lower middle series are much larger, and transversely elongated.

The limbs are slender and elongated; the anterior pair, in being brought forwards, extends as far as the nostrils. The fingers are slender, compressed, unequal; the third and fourth, longest. When the posterior pair is extended forwards, the longest toe reaches the axilla. The toes themselves are long, slender, and unequal; the fourth being the longest; the third and fifth, nearly equal. The scales upon the anterior aspect of both pairs of limbs are considerably larger than on their posterior aspect. The palms and soles are covered with flattened tubercles, and the inferior aspect of the fingers and toes, provided with transverse, very narrow, hence numerous, plates. The nails are stoutish, and compressed at the base; acute, and curved upon their extremities.

The color of the upper region is olivaceous-brown, maculated with black, assuming irregular or else interrupted transverse fasciae, which may be traced all along the tail; the limbs being variegated with black and greenish-olive, in transverse bands across the digits. A

dark patch may also be observed upon the temporal region. The inferior region being yellowish and unicolor.

Sometimes the upper region is greenish-olive, with obsolete brownish spots, disposed upon two series, on the posterior portion of the back and on the tail; the limbs being mottled with brown, and the digits transversely barred. Beneath, unicolor and yellowish, or whitish.

Specimens of middle size may exhibit a golden hue, with a series of black spots from the eye to the shoulder. The head, neck, and anterior region of the trunk unicolor, whilst posteriorly the back, sides, and limbs are speckled with black and greenish-olive.

Still smaller specimens may have a lateral black streak extending from the orbit to the base of the tail, with a lighter line above it, and a series of small black spots above the latter, leaving the middle region of the back unicolor. The lower portion of the sides, the limbs, and tail, speckled with black and greenish-olive.

Loc.—Navigator and Feejee Groups of Islands. "Frequently seen about the trunks, and sometimes on the extreme branches of trees, within a moderate height of the ground. Young very common in the woods."

3. Emoa nigrita, Grd.

Char. spec.—*Corpore robustiori, triginta octo seriebus squamarum ampliorum longitudinalibus coöperto. Scutis postfrontalibus non contiguis; scuto occipitali mediano distincto. Apertura auditoria modica, subcirculari, simplici. Scutellis praeanalibus quam reliquis majoribus. Cauda subcylindrica, mediocris longitudinis. Colore supra fusco-nigrescente, aequabili; infra pallidiori.*

Spec. Char.—Body stoutish, covered with thirty-eight longitudinal series of well-developed scales. Postfrontal plates not contiguous. Middle occipital distinct. Auricular aperture moderate, subcircular, and simple. Preanal scales larger than the rest. Tail subcylindrical, of moderate length. Uniform brownish-black above; lighter beneath.

Syn.—*Eumece nègre,* Hombr. & Jacq. Voy. au Pole Sud et dans l'Océanie, Pl. iv, fig. 2.

Emoa nigrita, Grd. in Proc. Acad. Nat. Sci. Philad. November, 1857.

Observ.—This species is closely allied to *E. cartereti* (*Eumeces carteretii*, Dum. & Bibr.) : first, by its system of coloration, which is of a uniform hue, and secondly, by its physiognomy, as well as general structure. It differs from it, however, by the absence of erect scales at the anterior margin of the auricular aperture, and the separation of the postfrontal plates (fronto-nasals), owing to the contiguity of the vertex plate with the prefrontal.

In identifying this species, we have had for sole guidance the fine figure which is given of it in the Atlas accompanying the "Voyage au Pole Sud et dans l'Océanie," and in so doing, we have passed over certain details exhibited thereon, ascribing them to the iconographer, rather than to infer that the species before us was distinct. It is a subject, however, into which we hope the naturalists of the "Museum d'histoire naturelle," in Paris, will carefully look, comparing the specimens, there preserved, with the description which we offer.

Descr.—It is a stouter species than *E. samoensis*, provided with a head much less depressed, a broader and thicker snout, and a shorter tail. The postfrontal plates are separated by the extension of the vertex plate to the prefrontal, which is sublozenge-shaped, nearly as broad as long. The vertex plate is more elongated also. The auricular aperture is simple, instead of being denticulated in front.

The scales are disposed upon thirty-eight longitudinal series, hence, more numerous than in *E. samoensis:* six dorsal series, ten abdominal ones, and eleven on either side. The preanal scales of the external series are larger than the rest. They are also larger on the tail, where the middle series above and below are transversely elongated, simulating the scutellae which are observed in other families. The base of the tail itself is very broad, stout, and depressed, posteriorly conical, and tapering into a compressed point. The palms and soles are covered with more minute granules than in *E. samoensis*, and the transverse plates under the digits somewhat broader.

The color is of a uniform brownish-black above, somewhat lighter beneath.

Loc.—Samoa, Navigator Group. Very common.

"It is strong and active, biting very severely. Seems to keep chiefly near the ground, among stones, being seldom seen ascending trunks of trees."

4. Emoa cyanura, Grd.

Spec. Char.—Body slender, rather depressed; scales well developed, disposed upon thirty longitudinal series. Postfrontals separated. Middle occipital plate combined with the united parietals. Auricular aperture moderate, subelliptical, with a few small erect scales at the anterior margin. Two middle preanal scales larger than the rest. Tail long and subconical. Above brown or black, with three longitudinal light streaks, middle one extending from the apex of the snout to the base of the tail; beneath unicolor.

Syn.—*Scincus cyanurus*, Less. Voy. Coq. Zool. II, 1, 1830, 49. Pl. iv, fig. 2.
Scincus celestinus, Mus. Leyden. (Fide Duméril & Bibron.)
Tiliqua cyanura, Gray, Ann. Nat. Hist. II, 1839, 289.
Tiliqua lessonii, Cocr. Tab. synopt. Scincoid. (Compt. rend. Acad. des Sc. IV, 1837.)
Tiliqua kienerii, Cocr. Tab. synopt. Scincoid. (Compt. rend. Acad. des Sc. IV, 1837.)
Eumeces lessonii, Dum. & Bibr. Erpét. gén. V, 1839, 654.
Mabouya cyanura, Gray, Catal. Lizz. Brit. Mus. 1845, 96.

Descr.—This species is one of small size: its body is slender, subcylindrical, covered with rather well-developed scales, if compared to those of its congeners. They constitute thirty longitudinal series, a good deal smaller on the sides than on the back and belly; those of the back being somewhat the largest, especially along the middle line. The two middle preanal scales are a good deal larger than the rest. The upper middle caudal series is quite large and transversely elongated, and so is the lower middle series also; sometimes one double series of ordinary shape intervenes between them. On the sides of the tail, they are nearly equal to those of the back.

The head is depressed; the snout narrow and tapering, resembling somewhat that of *E. samoensis*. The symphyseal plate is larger than the rostral; the supranasals and postfrontals are kept widely apart by the prefrontal, which is contiguous anteriorly to the rostral, and posteriorly to the vertex plate. The latter is quite elongated, spear-shaped posteriorly. The combined parietals are furthermore united to the middle occipital, forming together a large lozenge. The latero-occipitals are well developed, as usual approximating posteriorly, as do

also the postoccipitals. There are but seven upper labials: the fifth being the largest, and situated under the eye, forming the inferior rim of the orbit; the four anterior are subquadrangular; the two posterior, subrhomboid, deeper than long. The temporal shields are well developed. The auricular aperture is moderate, subelliptical, provided anteriorly with small scales, which give to that margin a denticulated appearance. The second pair of mental shields are the largest.

The color above is either of a blackish, chestnut-brown, or deep greenish-coppery hue, with three longitudinal golden lines or streaks: one beginning at the apex of the snout, follows the middle line of the head, neck, and back to the base of the tail; two lateral ones originate upon the snout, in contact with the middle streak, pass, one on each side, over the upper edge of the orbit, hence along the sides of the body to the origin of the tail. Sometimes, the black and the brown hue of the ground color exist simultaneously, the black lining the golden streak, and the brown intermediate between two black lines. The sides, limbs, and tail are sometimes of a lighter brown or black, uniform; at others, the centre of each scale has a golden reflect, whilst its edge is darker. Beneath, the color is bluish, and the tail, occasionally, exhibits an azure-blue tint, which is never observed upon specimens preserved in alcohol. There are also instances where the tail is of a greenish-grey above, with a longitudinal darker line, and whitish beneath.

We have also observed some specimens of a blackish-brown tint above, with dull and diffused streaks, and beneath greyish-white.

Loc.—The species appears to be very abundant, and widely diffused over the islands of the Pacific Ocean, especially the coral islands. The Expedition has met with it on King's Island, Peacock's Island, Taheiti, Navigator and Feejee Groups, and Tongataboo. It is the commonest Saurian of all these islands, occurring near the coast, as well as in the interior land, in the woods and about the huts of the natives, by which it is most probably carried from island to island, since these animals appear to be absent from the uninhabited islands. The same species was also met with at the Sandwich Islands, and the Philippine Archipelago.

Fam. GEKKOTIDAE.

The representatives of this family are remarkable for their depressed body, covered above with granular scales, giving them a salamandroid aspect. On the belly, the scales are small, rhombic, and imbricated. In a few genera, the sides of the abdomen are somewhat expanded and fringed. The head is generally depressed and subtriangular, covered with granular scales also. The tongue is thick, short, slightly notched upon its extremity. The eyelids are circular; the pupil linear and vertical, occasionally round: the eyes being adapted to nocturnal vision. There are always two pairs of limbs; the feet being adapted to the walk. The toes are subequal, dilated, circular, subcircular, or subelliptical, lamellated beneath.

Syn.—*Geckoides*, Oppel, Rept. Prodr. 1811, 22.
Geckotiens, Cuv. Règn. Anim. II, 1817, 44; &, 2d ed. II, 1829, 72.—Dum. & Bibr. Erpét. gén. III, 1836, 237.
Geckones, Spix, Spec. nov. Lacert. Bras. 1825.
Ascalabotoidea, Fitz. Neue Class. Rept. 1826, 63.
Gekkonidae, Bonap. Sagg. Distr. Anim. Vertebr. 1831.
Ascalabotes, Dum. & Bibr. Erpét. gén. III, 1836, 237.
Geckotidae, Gray, Catal. Lizz. Brit. Mus. 1845, 142.

Nocturnal in habits, and avoiding the heat of the sun, the reptiles of this family feed on insects and worms, which they swallow whole. Their movements are swift and silent, the sound which they produce being caused by the motion of the tongue against the palate, and has suggested the name of *Gekko*, by which these animals are commonly known.

Genus GEHYRA, Gray.

Gen. Char.—Fingers and toes free, depressed, oval, much dilated towards the end, with transverse, entire plates beneath. Thumbs clawless. Back with small, granular scales. Femoral pores present. Tail rounded, provided with large scales beneath.

Syn.—*Gehyra*, Gray, Proc. Zool. Soc. Lond. II, 1834, 100; Zool. Misc. 1842, 57; &, Catal. Lizz. Brit. Mus. 1845, 162.
Perodactylus, Fitz. Syst. Rept. 1843, 103.

Observ.—In this genus, the scales which cover the dorsal region are quite small, granular, and uniform, giving to that region a smooth appearance. Upon the abdomen, they are larger than on the back, and assume again the shape of genuine scales. The latter are smooth, that is, not carinated. The pupil is vertically elliptical, so far as our observations go. The last phalanx is slender, compressed, and curved, terminated by a curved nail, and inserted above the expanded portion of the digits. The thumbs are clawless.

1. Gehyra oceanica, Gray.

Spec. Char.—Digits rather elongated. Dorsal scales minute and uniform. Abdominal scales subquadrangular on the middle of the belly. Reddish-brown above, spotted with white; whitish beneath.

Syn.—*Gecko oceanicus*, Less. Voy. Coq. Zool. II, 1, 1830, 42. Pl. II, fig. 3.
Gehyra pacifica, Gray, Proc. Zool. Soc. Lond. II, 1834, 100.
Gehyra oceanica, Gray, Zool. Misc. 1842, 58; &, Catal. Lizz. Brit. Mus. 1845, 163.
Naultinus pacificus, Gray, Zool. Misc. 1842, 58; Catal. Lizz. Brit. Mus. 1845, 169.
Gehyra gularis, Gray, MSS. Brit. Mus.
Hemidactylus oualensis, Dum. & Bibr. Erpét. gén. III, 1836, 350. Pl. xxviii, fig. 7.
Perodactylus oualensis, Fitz. Syst. Rept. 1843, 103.

Observ.—The upper labials are smaller than the lower, and the rostral is larger than the symphyseal. We observe as many as twelve upper, and twelve lower labials; the upper ones, diminishing gradually in size, from the rostral to the angle of the mouth; the third and fourth lower labials are the largest; the first is nearly equal to the fifth; the remaining ones diminish posteriorly. There are four pairs of mental shields; the middle pair being the longest, and the only one conspicuously developed. Many small plates may be observed beneath the lower labials, contrasting with the exceedingly minute granules which cover the region of the throat. The granules of the upper sur-

face of the head resemble those of the back, being but slightly larger upon the snout. The upper labials are lined with a series of very small plates. The upper surface of the limbs is granular also, except upon the carpus and tarsus, where the granules give way to small scales. The abdominal region is covered by genuine scales, larger upon the middle of the abdomen, where they are subquadrangular, than on the chest and pelvis, where they are subpyramidal in their outline; they are largest upon the middle femoral region, where, in the male, twenty pores on either side constitute a curved series, with the extremities of the scales contiguous upon the medial line. The scales upon the preanal region are equal to those on the pelvic region, but on the posterior portion of the thighs they assume a granular aspect. Under the leg, properly so called, the scales are as large as on the middle femoral region. The skin is exceedingly tender, and easily lacerated in the attempt to capture these animals.

The tail is subconical, slightly depressed, provided, upon the inferior mesial line, with a double series of rather large and somewhat irregular scales or plates; and, on each side of these, may be observed small and polygonal scales, passing to granules as they approximate the upper surface of that organ.

The upper regions are reddish-brown, spotted with white, and, occasionally, exhibiting a few black markings. The inferior regions are unicolor, of a whitish hue.

Loc.—Specimens of this species were collected on the Navigator Islands, and at Taheiti also. They were "often seen about the trunk of the trees, in the daytime, about the cocoanut tree, and also in the interior forest."

2. Gehyra vorax, Grd.

(Plate XVI, figs. 1–8.)

Char. spec.—*Digitis palmarum plantarumque amplis, brevissimis. Squamis dorsualibus parvis, aequalibus; abdominalibus subpyramidulibus seu lanceolatis. Supra fusca vel fusco-cinerea, nigro maculata; infra albescente, nigro punctata.*

SPEC. CHAR.—Fingers and toes broad and rather short. Dorsal scales small and uniform. Abdominal scales subpyramidal in outline. Brown or greyish-brown above, maculated with black; beneath whitish, dotted with black.

SYN.—*Gehyra vorax*, GRD. in Proc. Acad. Nat. Sci. Philad. November, 1857.
Moco, FEEJEES.

OBSERV.—This species is closely allied to the preceding one, but appears to grow to a much larger size. It is a stoutly built, strong animal, of a voracious disposition. The naturalists of the Expedition, who have observed it alive, state that it will even spring at a person, who may approach it while in captivity, and inflict a very severe bite.

DESCR.—The body is depressed, broader than deep, and thickest upon its middle region. The granulation of the back is proportionally coarser than in the preceding species: a fact easily ascertained by the comparison of specimens of equal size of both species. The abdominal scales, on the other hand, are smaller. The granules on the upper surface of the head, neck, and temporal region are a good deal smaller than on the back. The scales upon the carpus and tarsus are smaller than in the preceding species, as are also those on the inferior surface of the leg. The femoral scales are equal in size, and alike in outline to the abdominal ones; the series of femoral pores, of either side, are contiguous upon the mesial line: they are composed of nearly twice as many pores as in the preceding species.

The tail is subconical, somewhat depressed, constituting about the third, or rather more, of the total length. A single specimen has it preserved. Its upper surface is covered with granular scales, larger than those of the back, increasing in size laterally, becoming quite large along the middle of the inferior surface, assuming the aspect of scutellae, though irregular in outline, and variable in size.

The head is quite depressed, and, viewed from above, it is pyramidal in its outline. The nostril is subpyriform, and situated immediately above the commissure between the rostral and the first labial plate. Three small plates may be termed internasal, from their position, one above each nostril, the third in a notch of the rostral, and between the two just mentioned. There are fourteen upper labials,

gradually diminishing in depth towards the angle of the mouth. The lower labials are twelve in number, anteriorly more developed than the upper ones, and likewise diminishing in size posteriorly: none of them extending as far as the angle or the commissure of the mouth, which, from beneath the pupil, is arched upwards, and bordered with small scales, not distinguishable from those covering the rest of the head. The symphyseal is much smaller than the rostral, and hardly larger than the first lower labial. There is one pair of mental shields of moderate development; between each of which, and the labials, may be seen four or five small plates, diminishing in size backwards. The scales under the throat are reduced to minute granules.

The eye is large, and the orbit subcircular, bordered by a double row of small subconical scales. The auricular aperture is of moderate development, and distant from the angle of the mouth about one ocular diameter.

The legs are stout and short, the extremities of the toes hardly meeting one another when the posterior ones are bent forwards along the side of the abdomen. The inner toe is clawless; they are all broad, subelliptical, bordered with a series of narrow and elongated scales, minutely granular on their upper surface, and plated beneath, each plate being gently undulated.

The ground color above is blackish-brown, with cloudlike patches of black and greenish-white; the sides of the abdomen, legs, and tail exhibit conspicuous white spots, and a few black dots. Beneath, the hue is of a greyish-olive. The toes themselves appear to be entirely olivaceous. The labial plates being yellowish-olive.

The young are brown above, transversely and irregularly barred with black; beneath of a soiled white.

Loc.—Feejee and Raruka Islands.—It was often brought by the natives to Dr. Pickering, who observed it also at large.

Plate XVI, fig. 1, represents *Gehyra vorax*, size of life.
Fig. 2, is an upper view of the head.
Fig. 3, an inferior view of the same region.
Fig. 4, the left leg.
Fig. 5, profile of a clawed toe.
Fig. 6, upper view of the same.

Fig. 7, granulation of the back, somewhat magnified.
Fig. 8, abdominal scales, also slightly magnified.

Genus PEROPUS, Wiegm.

Gen. Char.—Pupil vertical. Fingers and toes slightly palmated, dilated upon their extremity, with transverse plates beneath, divided by a mesial groove. Thumbs clawless. Back covered with small, granular scales. Femoral pores present. Tail depressed, provided with small scales beneath.

Syn.—*Peropus*, Wiegm. Act. Acad. nat. cur. XVII, I, 1835, 238.—Dum. & Bibr. Erpét. gén. III, 1836, 350.—Gray, Catal. Lizz. Brit. Mus. 1845, 159.—Fitz. Syst. Rept. 1843, 103.

Observ.—The chief difference between this genus and *Gehyra*, consists in the structure of the subdigital plates, which are divided by a mesial groove, and obliquely disposed upon each half of the disk, so as to assume a fanlike aspect. The tail itself is flattened or depressed, whilst in *Gehyra* it is nearly cylindrical. As to the presence or absence of a membrane uniting partially the toes at their base, it may be met with in both genera.

1. Peropus mutilatus, Wiegm.

Spec. Char.—Eyes moderate. Mental shields rather large and polygonal. Tail laterally subserrated. Grey above, with small brownish spots. Beneath whitish.

Syn.—*Peropus mutilatus*, Wiegm. Act. Acad. nat. curios. XVII, I, 1835, 238.—Gray, Catal. Lizz. Brit. Mus. 1845, 159.—Fitz. Syst. Rept. 1843, 103.
Hemidactylus mutilatus, Dum. & Bibr. Erpét. gén. III, 1836, 354.

Observ.—A specimen of this species, answering to the description of the authors quoted above, was collected while the squadron explored the Balabac Strait. It is two and two-thirds of an inch long, the tail forming about the half of that length, in which the head enters

six times and a half. It must be an animal of very delicate texture, for it appears to be of difficult preservation.

The dorsal scales are smaller along the dorsal line than on the sides of the body. The rostral plate is low, subhexagonal, the nostrils being situated laterally, immediately behind the upper angles of the rostral plate. There are a few internasal, very small, plates; the fronto-nasal region exhibits somewhat larger, granular scales, than the occipital region, where they are as small as on the middle line of the back. The subgular scales are very small also. The mental region, properly so called, is covered with rather large, polygonal plates, disposed in pairs upon the mesial line. On the tail, the scales are arranged upon circular series; they are larger than on the back and sides; beneath that organ, they assume the same arrangement, and are likewise larger than on the abdomen.

The ground color of the upper regions is grey, with small, brown, irregularly dispersed spots. The inferior regions are whitish, unicolor.

Loc.—Balabac Passage, Philippine Archipelago.

2. Peropus neglectus, Grd.

Char. spec.—*Oculis magnis. Scutis mentalibus parvis, polygonalibus. Cauda a latere serrata. Supra fusco, nigro notato; infra unicolori.*

Spec. Char.—Eyes large. Mental shields small, and polygonal. Tail laterally serrated. Above brown, with black markings. Beneath unicolor.

Syn.—*Peropus neglectus*, Grd. in Proc. Acad. Nat. Sci. Philad. November, 1857.

Observ.—A single specimen of this species was collected. Its state of keeping will not permit a full description to be drawn. Compared to the preceding species, the eye is much larger, and the tail more conspicuously serrated laterally. The granulation of the upper regions, and the scales of the inferior regions, are larger than in *P. mutilatus*.

The ground color of the upper regions is light or yellowish-brown, with a few black dots, spots, or streaks, irregularly disposed. A conspicuous streak may be traced from the nostril to the eye, and from behind the eye, across the auricular aperture, to the shoulder, or else to the insertion of the anterior limbs. The inferior regions are unicolor, of a soiled white.

Loc.—The label having been lost in the unpacking, the fatherland of this species is not known to any degree of certainty. The specimen preserved is supposed to have been collected at Rio de Janeiro, Brazil, from the recollection of the naturalists of the Expedition.

Genus DACTYLOPERUS, Fitz.

Gen. Char.—Pupil circular or elliptical. Fingers and toes free, dilated upon their whole length, with two series of diverging plates beneath, divided by a groove. Thumbs wanting the last joint, and clawless. Upper regions covered with small, nearly equal scales. Femoral pores in the male. Tail depressed, provided beneath with large scutellae.

Syn.—*Dactyloperus*, Fitz. Syst. Rept. 1843, 103.
Peripia, Gray, Catal. Lizz. Brit. Mus. 1845, 158.

Observ.—This genus is closely allied to *Peropus*, from which it differs by the shape of the pupil, the unwebbed toes, and the presence of large plates or scutellae under the tail. To *Boltalia* it bears strong analogies, if not affinities, for, the thumb exhibits the rudiment of the last joint, which is adherent to the surface of the expanded digit, instead of being free and simply inserted upon it. The claw is not developed: a mere acute point being perceived at the apex of the rudimentary joint. A fact like this cannot fail to have a weight in the mind of some herpetologists, against the establishment of genera upon characters apparently so slight as those upon which *Boltalia*, *Dactyloperus*, and *Peropus* are based.

Dactyloperus insulensis, Grd.

Char. spec.—*Squamis notaeis quam lateralibus minoribus. Capite caudaque supra granulatis. Scutis mentalibus quatuor in seriem transversalem appositis. Supra fusco-cinereo, minimis punctis nigris notato; infra albescente.*

Spec. Char.—Scales along the middle region of the back smaller than on the sides. Upper surface of the head and tail granular. Four mental shields, placed side by side. Greyish-brown above, minutely speckled with black; whitish beneath.

Syn.—*Dactyloperus insulensis*, Grd. in Proc. Acad. Nat. Sci. Philad. November, 1857.

Descr.—In a specimen three inches and a half in total length, the tail measures an inch and a half. The rostral plate is subpentagonal; the nostril perforates a small plate situated sideways, in contiguity with the rostral. There are two small internaso-rostral plates. The upper surface and sides of the head being covered with granular scales, of somewhat coarser appearance upon the fronto-nasal region, than on the frontal and occipital regions. The orbit is circular and rather large; its diameter entering once and a half over the distance between its anterior rim and the extremity of the muzzle or snout. The auricular aperture is rather moderate, and distant from the orbit by one of its diameter. The subgular scales are quite small, whilst the mental shields are considerably developed. The middle pair is very large and elongated, narrowest posteriorly, contiguous anteriorly to the symphyseal and first labials. The adjacent pair is smaller than the former, and, like it, contiguous to the labials. A few small plates may be observed between the outer pair of mental shields and the parallel labials.

The upper region of the body is covered with small subcircular scales, a good deal smaller along the middle line of the back than on the sides; those protecting the abdomen are larger yet, and have a much smoother appearance. The inferior surface of the thighs, in the male, exhibit a continuous series of pores, about twenty in number, on either side. The upper surface of the tail is covered with granular

scales, whilst on the under surface, may be observed large plates or scutellae, the middle one being transversely elongated, constituting a regular row, which extends near the extremity of that organ.

The specimens before us are somewhat discolored: a greyish-brown hue seems to have pervaded the upper regions, with small and darker spots irregularly dispersed over the head, body, limbs, and tail. The labial plates are dark brown, with a light marginal fillet. The inferior regions are whitish, either unicolor or provided with a minute dark spot or dot upon each scale.

Loc.—Oahu and Kauai, Sandwich Islands.

Genus CROSSURUS, Wagl.

Gen. Char.—Toes semipalmated, dilated upon their anterior extremity, all provided with a nail; plates, underneath, divided by a median groove. No femoral pores. Tail depressed, provided beneath with a series of large scutellae.

Syn.—*Crossurus*, Wagl. Naturl. Syst. Amph. 1830, 141.—Gray, Catal. Lizz. Brit. Mus. 1845, 158.

Observ.—In accordance with Gray, we restore the genus *Crossurus* of Wagler, and place in it a second species, which has been referred to the genus *Hemidactylus* by modern writers; and, still more recently, was made the type of a distinct genus under the name of *Platyurus*. Femoral pores are ascribed to the male sex of the latter genus: a fact which would establish another difference between it and *Doryura*, which it approximates quite closely. The web at the base of the toes, the presence of a nail to the thumb as well as to the fingers, the absence of femoral and anal pores, and the depressed tail, are as many characters which commend the genus *Crossurus* to our attention.

Crossurus platyurus, Grd.

Spec. Char.—Sides of body and thighs provided with an expanded membrane. Tail flattened, laterally thin and fringed. Greyish, with black streaks and spots.

Syn.—*Stellio platyurus*, Schn. Denks. Münch. Akad. 1811, 30. Tab. 1, fig. 3.
Lacerta schneideriana, Shaw, Gen. Zool. III, 1802, 278.
Gekko platyurus, Merr. Tent. Syst. Amph. 1820, 41.
Gecko marginatus, Griff. in *Cuv.* Anim. Kingd. IX, 1831, 147.
Hemidactylus platyurus, Wiegm. Act. Acad. nat. cur. XVII, 1, 1835, 238.
H. marginatus, Cuv. Règn. Anim. 2d ed. II, 1829, 54; &, ed. illustr. Rept. 77.—Wiegm. Naturl. Syst. Amph. 1830, 145.—Gray, Synops. Rept. in *Griff.* Anim. Kingd. IX, 1831, 51.—Dum. & Bibr. Erpét. gén. III, 1836, 370. Pl. xxx, fig. 2.
Platyurus schneiderianus, Gray, Catal. Lizz. Brit. Mus. 1845, 157.

Obsery.—We do not see the propriety of adopting the genus *Platyurus* for the present species, as proposed by John Edward Gray, having failed observing the characters which he assigns to it. The materials at our command, however, are somewhat deficient; and, we should have considered it premature to discuss this subject to any greater length.

Loc.—The solitary specimen in the collection is labelled "East Indies."

Genus HEMIDACTYLUS, Cuv.

Gen. Char.—Fingers and toes free, dilated towards their anterior extremity, and all provided with a nail; plates, underneath, in two diverging series, divided by a mesial groove. Femoral pores present. Body with a slight ridge on the lower part of the sides. Tail subdepressed, provided beneath with large scales or scutellae.

Syn.—*Hemidactylus*, Cuv. Règn. Anim. II, 1817, 47; 2d ed. II, 1829, 54; &, ed. ill. Rept. 77.—Wagl. Naturl. Syst. Amph. 1830, 142.—Wiegm. Herp. Mexic. 1834, 20.—Dum. & Bibr. Erpét. gén. III, 1836, 344.—Gray, Catal. Lizz. Brit. Mus. 1845, 152.

Obsery.—The genus *Hemidactylus*, as here understood, includes some of the "Dactylotèles fissipèdes," of Messrs. Duméril & Bibron. The limits ascribed to it by various writers appear to us a good deal wider than will hereafter be found expedient, when the species shall have been more thoroughly investigated.

1. Hemidactylus mabuia, Cuv.

(Plate XXV, figs. 9–16.)

Spec. Char.—Small, conical tubercles, disposed upon longitudinal series along the upper region of body and tail. Femoral pores constituting a continuous series in advance of the vent. Yellowish-brown, with black spots across the back. Beneath unicolor.

Syn.—*Hemidactylus mabuia*, Cuv. Règn. Anim. 2d ed. II, 1829, 54; &, ed. illustr. Rept. 77.—Gray, Catal. Lizz. Brit. Mus. 1845, 154.

Hemidactylus mabouia, Dum. & Bibr. Erpét. gén. III, 1836, 362.

Gecko mabuia, Mor. de Jonn. Monogr. 1821.—Griff. *Cuv.* Anim. Kingd. IX, 1831, 146.—Gray, Synops. in *Griff.* Anim. Kingd. IX, 1831, 51.

Gecko aculeatus, Spix, Spec. nov. Lacert. Bras. 1825, 16. Tab. xviii, fig. 3.

G. incanescens, Neuw. Reise nach Bras. I, 1815, 106; Beitr. Naturg. Bras. I, 1825, 101; &, Rec. Pl. Col. d'Anim. Pl. fig. 2.

G. armatus, Neuw. Reise nach Bras. 1811, 5, 106; Beitr. Naturg. Bras. I, 1825, 104; &, Rec. Pl. Col. d'Anim. Pl. fig. 3–6.

Thecadactylus pollicaris, Spix, Spec. nov. Lacert. Bras. 1825, 17. Tab. xviii, fig. 2.

Tachybates mabuya, Fitz. Syst. Rept. 1843, 105.

Observ.—The upper surface of the head is minutely granular: there being a few very small tubercles scattered over the occipital region. The inferior surface of the head has likewise a granular aspect, owing to the diminutiveness of the scales, and which contrast very much with the large, subtriangular, mental shields, of which there are two pairs, placed sideways of the symphyseal, and contiguous to the lower labial plates. The tail is longer than the body and head together, and tapering into a point. We perceive no preanal pores, properly so called, but the femoral ones are very conspicuous, constituting a continuous series across the interfemoral region. The abdominal scales are tiles-like; on the femoral and postanal regions, they are largest, the series under the tail excepted.

A colored sketch of this species having been made from a live specimen caught at Rio de Janeiro, in December, 1838, exhibits the upper regions of the animal as being of a fulvous hue, or yellowish-brown. The head is indistinctly spotted with dark brown, and along the back may be seen five or six transverse, dark brown blotches, subpentagonal

in shape, posteriorly angular, and margined with whitish. Obsolete brown bars are observed across the legs, fingers, and toes. The tail has a semiannulated appearance: the same dark spots extending over it in the form of transverse bands. Beneath, the coloration is uniform yellowish-white.

Loc.—Several specimens were collected in the vicinity of Rio de Janeiro, Brazil.

Plate XXV, fig. 9, represents *Hemidactylus mabuia*, size of life.
Fig. 10, is an upper view of the head;
Fig. 11, its profile; and,
Fig. 12, an under view of the same region.
Fig. 13, the left hand, from above;
Fig. 14, the same hand, from beneath.
Fig. 15, a group of dorsal scales;
Fig. 16, a group of abdominal scales.
Figs. 10–16, are somewhat magnified.

2. Hemidactylus cyanodactylus, Grd.

(Plate XXV, figs. 17–24.)

Spec. Char.—Subtrihedral tubercles scattered over the upper regions of the body. Digital disks rather narrow. Series of femoral pores separated by one scale. Greyish above, marmorated with brown; beneath unicolor.

Syn.—*Gecus cyanodactylus*, Rafin. Caratt. nuov. gen. &c. 1810, 9.

Hemidactylus verruculatus, Cuv. Règn. Anim. 2d ed. II, 1829, 54; &, ed. illustr. Rept. 77.—Bory & Bibr. Expéd. Sc. Morée. III, 1, 1832, 68. Tab. xi, fig. 2 *a b*, 3e série. —Dum. & Bibr. Erpét. gén. III, 1836, 360.—Gray, Catal. Lizz. Brit. Mus. 1845, 154.

Hemidactylus granosus, Rupp. Atlas. Rept. 1827, 17. Pl. v, fig. 1.

Gecko verruculatus, Griff. *Cuv.* Anim. Kingd. IX, 1831, 146.

Hemidactylus verrucosus, Gray, Synops. Rept. in *Griff.* Anim. Kingd. IX, 1831, 50.

Hemidactylus triedrus, Bonap. Faun. Ital. 1840. (Fig. 2.)

Hemidactylus burtonii, Gray, Brit. Mus. (Vid. Catal. Lizz.)

Le petit lézard gris et moucheté, Edw. Hist. Nat. Ois. Rar. 1751. Pl. ccIV.

Observ.—A few small tubercles are scattered over the occipital region, the rest of the surface of the head being finely granular, somewhat coarser, however, upon the fronto-nasal space. The scales under the head are small, subgranuliform, preceded anteriorly by one pair of quite large, subtriangular, mental shields, inclosing entirely the symphyseal; and upon its sides, contiguous to the lower labial plates, is a second pair of small mental shields or chin scales, as sometimes termed. The series of scales adjoining the lower labials are somewhat elongated, and larger than the rest. The dorsal tubercles do not extend over the arms and forearms, though they may be traced along the hind legs as far as the tarsi. The series of femoral pores of either side is separated from its fellow by an intervening scale.

The color of the upper region is greyish-red, marbled or rather marmorated with dark brown; the tail is transversely spotted, assuming a semi-annulated aspect. The inferior region is whitish, unicolor. A drawing from life was made in October, 1838.

Loc.—Port Praya, San Jago, Cape de Verde Islands.

Plate XXV, fig. 17, represents *Hemidactylus cyanodactylus*, size of life.

Fig. 18, is a view of the head from above;
Fig. 19, its profile; and,
Fig. 20, an under view of the same region.
Fig. 21, the left hand, from above;
Fig. 22, the same hand, from beneath.
Fig. 23, a group of dorsal scales;
Fig. 24, a group of abdominal scales.
Figs. 18–24, are somewhat magnified.

Genus DORYURA, Gray.

Gen. Char.—Fingers and toes free, dilated towards their anterior extremity, and all provided with a nail or claw; plates, underneath, in two diverging series, divided by a median groove. Femoral pores absent. Back covered with minute, uniform, granular scales. Sides of body and limbs, simple. Tail very much depressed, covered above

with small scales, flattened beneath, with a sharp edge more or less denticulated, and a central series of large plates or scutellae.

Syn.—*Doryura*, Gray, Catal. Lizz. Brit. Mus. 1845, 156.

Observ.—This genus is perhaps more closely allied to *Hemidactylus* than to any other of the same group, for, the chief differences consist simply in the uniform granular scales which cover the upper surface of the body, and in the shape and structure of the tail. The latter is very much depressed, superiorly convex, with sharp lateral edges, often denticulated, whilst its inferior surface is quite flattened, resembling the same organ in *Crossurus platyurus*. The central series of large plates, or scutellae, are met with in other genera. We find no femoral pores upon the specimens now before us: so that if their absence prove to be a constant fact, we shall have another character to distinguish *Doryura* from *Hemidactylus*.

Doryura vulpecula, Grd.

(Plate XXIV, figs. 17–24.)

Char. spec.—*Capite depressiusculo, antice subacuto. Collo tumido. Tergo granulis minimis aequalibus, et cauda parvis squamis, coöpertis. Scutis mentalibus in quadratum dispositis, antice labialibus contiguis. Cauda minuente, a latere laevi. Supra cinerea vel fusco-flava; infra pallidescente; nonnunquam albo punctata.*

Spec. Char.—Head quite depressed, and subacute anteriorly. Neck swollen. Back covered with minute, equal granules, and tail with small scales. Four mental shields, disposed upon a square, anteriorly contiguous to the labial plates. Tail tapering, nearly even laterally. Grey or yellowish-brown, lighter beneath than above, and occasionally spread over with pale dots.

Syn.—*Doryura vulpecula*, Grd. in Proc. Acad. Nat. Sci. Philad. November, 1857.

Observ.—By its coloration, this species reminds us of *D. bowringi*, from which it chiefly differs by the presence, on the tail, of small

scales, instead of "equal granules." From *D. garnoti* it differs by a more pointed snout or muzzle, and by the sides of the tail not being denticulated.

Descr.—We have had an opportunity of examining several specimens of both sexes, the largest of which measuring a little over four inches in total length. The general appearance of the species is uniformly smooth : a trait more or less generic, we concede. The head and body are slender; both, quite depressed. The head especially is very flat, wedge-shaped, slightly concave upon the middle line of the frontal region. The snout is rather elongated, subacute. The nostril is contiguous anteriorly to the rostral plate, and surrounded upon the rest of its periphery by four very small plates: the inferior one resting upon the first upper labial. The eye is large and circular; the diameter of the orbit entering nearly twice upon the space between its anterior rim and the extremity of the snout. The auricular aperture is small and subcircular. The upper surface of the head, like that of the body, is covered with granular scales, somewhat larger on the frontonasal region than on the back, and much smaller than the latter, on the occipital and interocular regions. Under the head, over the hyoid region, properly so called, the granules are equal in size to those along the sides of the body, whilst the mental region exhibits four polygonal shields, disposed upon a square in two pairs, one in advance of the other: the anterior pair being contiguous to the symphyseal plate and the first lower labials; the posterior pair, somewhat smaller, contiguous to the former, but separated from the labials by a narrow space, occupied by small scales, which may be traced all along the branch of the lower jaw. The mental shields of the anterior pair are, moreover, contiguous to each other upon the mesial line of the chin, whilst those of the posterior pair are separated from each other, upon that same mesial line, by a few small scales or granules. The sides of the neck are quite swollen, and granular, like the body. At the lower portion of the sides, may be seen a slight ridge, extending from near the axillae to the groins. The abdomen is protected by smooth, subcircular scales, disposed upon longitudinal series, smallest upon the chest, and largest under the thighs, assuming a lanceolated shape upon the preanal region. There are no femoral pores. The upper and posterior surfaces of the legs, inferior surface of the arms and forearms, and upper surface of the toes, are granular like the body, whilst small scales are to be observed upon

the anterior surface of the arm and forearm, and upon the inferior surface of the thigh and leg, properly so called. The tail is a little shorter than the body and head together; its upper surface is covered with small, smooth, imbricated, posteriorly rounded scales; whilst its inferior surface is protected by a central series of transversely elongated plates or scutellae, more developed in the male than in the female. The sides of that organ are sharp, though not otherwise serrated or denticulated.

The color is sometimes greyish; at others, yellowish-brown, and, as usual, of a much lighter hue beneath than above. Pale dots may be seen indiscriminately scattered all over, though, generally speaking, more apparent upon the neck and anterior portion of the body; in very young specimens, these dots are apparently wanting, but the upper surface of the tail exhibits pale, transverse, narrow streaks.

Loc.—Sandwich Islands.

Plate XXIV, fig. 17, represents *Doryura vulpecula*, size of life.
Fig. 18, is an upper view of the head;
Fig. 19, its profile; and,
Fig. 20, an under view of the same region.
Fig. 21, the left hand, from above;
Fig. 22, the same hand, from beneath.
Fig. 23, a group of dorsal granules.
Fig. 24, a group of abdominal scales.
Figs. 18–24, are somewhat magnified.

Genus ASCALABOTES, Cuv.

Gen. Char.—Pupil vertical. Symphyseal plate elongated. Back covered with granules and scale-like tubercles. Neither preanal nor femoral pores. Tail rather depressed, subangular above, with cross-rings of tubercular spines. Fingers and toes free, subequal, protected by continuous transverse plates beneath; third and fourth, with the last joint compressed, clawed; the rest, the thumb included, without the last joint, and clawless.

Syn.—*Ascalabotes*, Cuv. Règn. Anim. II, 1817, 44; 2d ed. II, 1829, 51; &, ed. illustr. Rept. 72.—Fitz. Neue Class. Rept. 1826, 13; &, Syst. Rept. 1843, 102.—Bonap. Faun. Ital. II, 1832.

OBSERV.—There is no reason for suppressing entirely the name of *Ascalabotes*, as applicable to a genus of the Gecko's family. It corresponds to the Division A of the "Hétérolépidotes fissipèdes" or *Dionyx*, of Duméril & Bibron, also to *Tarentola*, of John Edward Gray.

ASCALABOTES DELALANDII, Fitz.

(Plate XXV, figs. 1–8.)

SPEC. CHAR.—Tubercles of the back simple, oval, very slightly keeled; upon the sides, conical. Ground color pale or greyish-brown, with irregular cross-bands, generally edged with white behind. Numerous small spots of reddish-brown. Tail annulated with blackish-brown.

SYN.—*Platydactylus, delalandii*, DUM. & BIBR. Erpét. gén. III, 1836, 324.—GERV. in Bull. Soc. Philom. 1839; &, in *Webb & Berth.* Hist. nat. Canar. II, ii, 1836, Rept. 5.

Ascalabotes delalandii, FITZ. Syst. Rept. 1843, 102.

Tarentola delalandii, GRAY, Catal. Lizz. Brit. Mus. 1845, 165.

OBSERV.—One specimen, collected at Cape de Verde Islands, was drawn and colored from life. We are glad that such a valuable acquisition to herpetology should have found a place on the Atlas accompanying this Report.

The ground color of the upper regions is greyish-brown, darker along the middle line of the back and top of the head than on the sides. Small reddish-brown spots are disposed upon longitudinal series on the body, irregularly scattered upon the legs and toes, and arranged upon the tail according to the structure of that organ. The irregular cross-bands are quite obsolete; the white edges, if they existed, are no longer seen. Beneath, the color is whitish or straw-colored, maculated with reddish-brown.

LOC.—San Jago, Cape de Verde Islands.

Plate XXV, fig. 1, represents *Ascalabotes delalandii*, size of life.
Fig. 2, is an upper view of the head;

Fig. 3, its profile; and,—fig. 4, an under view of the same region.
Fig. 5, the left hand, from above;—fig. 6, the same, from beneath.
Fig. 7, a group of dorsal scales.
Fig. 8, a group of abdominal scales.
Figs. 2–8, are somewhat magnified.

Genus GEKKO, Laur.

Gen. Char.—Pupil vertical. Back scaly, with scattered larger tubercles. Femoral pores, but no preanal ones. Tail subquadrangular. Fingers and toes free, unequal, dilated towards their extremity, protected beneath with continuous, transverse plates; the last joint short, compressed, inflexed, clawed. Thumbs without the last joint, hence clawless.

Syn.—*Gekko*, Laur. Synops. Rept. 1768, 43.—Merr. Tent. Syst. Amph. 1820, 39.

Gecko, Daud. Hist. nat. Rept. IV, 1802, 105.—Oppel, Rept. Prodr. 1811, 23.—Cuv. Règn. Anim. II, 1817, 44.—Gray, Catal. Lizz. Brit. Mus. 1845, 160.

Observ.—This genus corresponds, to a certain degree, to the Division B, "Hétérolépidotes fissipèdes, *Tetronyx*," which Messrs. Duméril & Bibron have established in their genus *Platydactylus*.

1. Gekko indicus, Grd.

(Plate XVI, figs. 9–16.)

Spec. Char.—Longitudinal rows of large and distant tubercles on the back, with imbricated, quadrangular, and smooth scales. A series of hexagonal, large gular shields in front, under the lower labials. Color greyish-blue, spotted with orange-red.

Syn.—*Salamandra indica*, Bont. in Piso: Ind. utr. re nat. et med. 17 . . , 57.

Gekko ceylonicus, Seba, Thes. Nat. I, 1734, 170. Tab. CVIII, fig. 1–9.

Lacerta gecko, Linn. Mus. Adolph. Fred. I, 1754, 46; &, Syst. Nat. I, ed. XII^{a}, 1766, 365.—Gm. *Linn.* Syst. Nat. ed. XIII^{a}, 1788, 1068.—Shaw, Gen. Zool. III, 1802, 264. Pl. lxxvii.

L. guttata, Hermann, Obs. Zool. Posth. 1804, 156.

Gekko teres, Laur. Synops. Rept. 1768, 44.

Gekko verticillatus, Laur. Synops. Rept. 1768, 44.

Gecko guttatus, Daud. Hist. nat. Rept. IV, 1802, 122. Pl. xlix.—Cuv. Règn. Anim. II, 1817, 46; 2d ed. II, 1829, 53; &, ed. illustr. Rept. 75.

Gekko verus, Merr. Tent. Syst. Amph. 1820, 42.

Gecko verus, Gray, Zool. Journ. III, 1827, 223; &, Catal. Lizz. Brit. Mus. 1845, 160.

G. annulatus, Kuhl, Beitr. Zool. u. vergl. Anat. 1820, 132.

Platydactylus guttatus, Dum. & Bibr. Erpét. gén. III, 1836, 328. Pl. xxviii, fig. 4. —Guer. Iconogr. Règn. Anim. 1834. Pl. xiii.

Salamandra ou Gecko de Linneus, Knorr, Delic. Nat. II, 1767. Tab. lvi, fig. 3.

Gecko à gouttelettes, Daud.;—Cuv.

Observ.—This species having been so often described, and so badly illustrated, herpetologists will welcome the accompanying figure, drawn from life in February, 1842.

After introducing such figures as are given on Plate XVI, any further description becomes superfluous. The large eye, the well-developed auricular aperture, the aspect of the upper surface of the head, the series of large gular shields lining the lower labial plates, the preanal pores, the upper and lower surface of the digits, and the scales of the back and of the belly, are represented as truthfully as art could attain. The inferior surface of the head and that of the tail, alone, are not exhibited in a structural point of view: the former is covered with small, subcircular, or polygonal scales, and the latter, provided with a median series of larger plates.

As to the coloration, the authors are somewhat at variance. The specimen before us exhibits a greyish-blue ground on the upper surface of the head, body, limbs, and tail, with a few small patches of a deeper blue along the back, and spotted all over with orange-red; the spots on the head uniting occasionally into sinuous lines. The dorsal region is lighter. The tail is semi-annulated with the same tint. The upper surface of the toes is of a light saffron-yellow, transversely barred with orange. The inferior surface of the animal is of a uniform whitish-yellow.

Loc.—From a small island in Balabac Strait, near China Seas.

Plate XVI, fig. 9, represents *Gekko indicus*, size of life.
Fig. 10, is an upper view of the head;
Fig. 11, a lower view of the same.
Fig. 12, the vent, in order to show the preanal pores.
Fig. 13, upper surface of the second toe;

Fig. 14, lower surface of the same.
Fig. 15, a group of dorsal scales.
Fig. 16, a group of abdominal scales.
Figs. 13–16 are somewhat magnified.

2. Gekko monarchus, Gray.

Spec. Char.—Numerous conical tubercles on the back, and small, flat, polygonal scales. Ground color brown, with two longitudinal dorsal series of black spots. Beneath white.

Syn.—*Platydactylus monarchus*, Schleg. Mus. Leyd.—Dum. & Bibr. Erpét. gén. III, 1836, 335.
Gecko monarchus, Gray, Catal. Lizz. Brit. Mus. 1845, 161.

Observ.—The head is quite depressed, nearly wedge-shaped, subconical anteriorly, and quite broad across the temporal regions. There are two elongated mental shields, constituting one pair, on each side of which may be seen two or three hexagonal small plates; the subgular scales adjoining being also somewhat larger than the rest. The auricular aperture is vertically oblong, and rather large. The sides of the neck exhibit several irregular folds. The upper surface of the body and limbs is covered with very small, smooth and polygonal scales, and numerous small conical tubercles irregularly dispersed over the body and limbs, whilst on the tail, they are disposed upon verticils: here the polygonal scales are likewise larger. A fold of the skin extends from the axillae to the groins, separating the dorsal from the abdominal region. Here the scales are much larger than on the back, subquadrangular, or rather lozenge-shaped, nearly equal: those on the chest being somewhat smaller; under the throat, they are smaller still, and under the head, almost granular; under the arm and in the axilla, granular also, increasing somewhat under the forearm; under the thighs and legs, they maintain good proportions, in the midst of which, a series of sixteen or eighteen pores distinctly appears along each thigh, not continuous upon the interfemoral region. On the posterior surface of the thigh, the scales assume a granular aspect.

The tail itself is longer than the body and head together, subquadrangular upon its base, conical, and tapering posteriorly. A series of

transversely elongated plates or scutellae may be observed along its under surface.

The color of the upper regions is brown, with two longitudinal series of black spots, one on each side of the dorsal line, and which may be traced along the tail, the spots combining into one patch upon the conical portion of the same organ, giving to it a semi-annulated appearance. One or more, indistinct series of smaller spots, may be observed along the sides of the back, extending even over the limbs, where they have a tendency to assume a transverse arrangement. The inferior regions are unicolor, of a dull whitish hue.

Loc.—Singapore.

Genus HOPLODACTYLUS, Fitz.

Gen. Char.—Body elongated, rather slender, and depressed. Back minutely granular; abdomen protected by small and smooth scales. Head depressed, subconical anteriorly, granular. Pupil vertical. Nostrils lateral. Auricular aperture large, simple. Labial plates diminishing posteriorly, extending as far as the posterior rim of the orbit. No mental shields. Chin covered with small plates; throat minutely granular. Limbs moderately developed. Palms and soles minutely scaly. Fingers and toes, five, unequal, dilated, with transverse and simple plates beneath; last joint compressed, inflexed, inserted above the dilated edge of the antepenultimate joint. Tail of moderate development, subcylindrical, tapering, provided, on each side of the base, with spine-like scales. A patch of interfemoral pores disposed upon several ogees. Femoral pores wanting.

Syn.—*Hoplodactylus*, Fitz. Syst. Rept. I, 1843, 100.
Pentadactylus, Gray, Catal. Lizz. Brit. Mus. 1845, 160.

Observ.—The history of this genus is more or less interwoven with that of *Naultinus*. J. E. Gray does not appear to have understood these genera, though both of them are of his own creation. We are compelled, however, to substitute Fitzinger's name for Gray's, as having priority. They bear to each other close affinities in many structural points; the chief difference between the two resides in the structure of the toes.

The genus includes a portion of the "Homolépidotes fissipèdes, *Pentonyx*," of Duméril & Bibron: their *Platydactylus duvaucelii* belongs to it. *Naultinus pacificus*, of Gray (Zool. Misc. 1842, 58), is a true *Gehyra;* the species referred to under the same name in Dieffenbach's "Travels into New Zealand, II, 1843, 203," and subsequently called *N. granulatus*,* may, after all, prove to be identical with the species described below, but since its identity cannot be established upon the published documents, we had to resort to a new name to record the latter. *Naultinus brevidactylus*, Gray, and *N. maculatus*, Gray, place us in the same perplexity towards the species we are going to describe, the toes of which being anything but short. At any rate, all the species named by J. E. Gray, and referred to the group of brown colors in his genus *Naultinus*, belong to the genus *Hoplodactylus*, which is a Platydactylian.

As to *Gecko pacificus*, Gray (Brit. Mus.), we cannot otherwise account for except as a synonym to *Naultinus pacificus*, of the same writer, and hence goes to *Gehyra* also.

Hoplodactylus pomarii, Grd.

(Plate XVIII, figs. 10–16.)

Char. spec.—*Scutis mentalibus nullis, et in loco eorum scutellis minimis. Squamis abdominalibus minutissimis, subcircularibus vel subrhomboïdalibus. Supra fusco-rubro, cum maculis atris elongatis, plus minusve confluentibus, in series longitudinales ordinatis; infra cinereo, unicolori.*

Spec. Char.—No mental shields, instead of which some very small plates. Abdominal scales very small, subcircular, or subrhomboid. Upper regions of a dark reddish ground, over which are arranged, longitudinally elongated, black blotches, more or less confluent. Beneath greyish, unicolor.

Syn.—*Hoplodactylus pomarii*, Grd. in Proc. Acad. Nat. Sci. Philad. November, 1857.

Descr.—The head is well developed, elongated, depressed, subcon-

* Catal. Lizz. Brit. Mus. 1845, 273.

cave upon the middle, and, when seen from above, has the shape of an acute triangle rounded at the summit. Its upper surface is minutely granular upon the posterior region; the granules being somewhat larger on the frontal and rostral regions. The internasal space is covered with ten or twelve small hexagonal plates: the middle ones being a little larger than the peripheric. The nostrils are conspicuous, lateral, situated immediately behind the rostral plate and above the first labial. The rostral plate itself is rather large, parallelogramic, nearly twice as long as deep, subconcave upon its upper edge. The upper labials are thirteen on either side, anteriorly deeper than long, and diminishing gradually backwards to the last one, which is a minute plate. The symphyseal is smaller than the rostral, subtriangular in shape, and entirely inclosed by the first pair of lower labials, of which there are eleven or twelve pairs equally diminishing backwards, so as to make of the last a very small plate; they extend a little further back than the upper labials; the anterior two are much deeper than long: the third being nearly subquadrangular; the rest diminish suddenly from the fourth, besides tapering off posteriorly. There are no mental shields, properly so called: the chin is protected by very small, subhexagonal plates. The rest of the under surface of the head, the throat, and neck is minutely granulated. The sides of the neck exhibit a few oblique folds, being covered, as well as its upper surface, with minute granules, like those of the posterior region of the head. The auricular aperture is rather large, and obliquely subelliptical. The eyes are large and circular, the eyelid being provided with small, subconical, erect, granular scales: the pupil is vertical.

The body is elongated, subcylindrical, depressed, covered above with small granules, slightly larger than on the posterior portion of the head and neck. The pectoral and abdominal regions exhibit very small, equal, subrhomboid, or subcircular scales, somewhat larger upon the interfemoral region, where they are perforated: the pores being disposed upon five ogees, closely set together, and fitting into one another: the exterior one, the largest, being composed of fourteen pores.

The limbs are well developed, though slender; the anterior pair extending over two-thirds of the distance towards the groins, when stretched backwards alongside the body; and the posterior pair three-fourths, towards the axillae, when dealt with in an analogous manner. The supero-posterior surface of the arms, forearms, legs, thighs, and tarsi, is granular, whilst their antero-inferior surface, as

also that of the carpi, palms, and soles, are covered with very small scales. The fingers and toes are slender, unequal, covered above with small scales, and protected beneath with transverse, slightly curved, undivided plates. The last joint, in all, is slender and compressed, scaly, and terminated by a small, acute, and curved nail.

The tail, in the specimen before us, is reproduced, so that its absolute length cannot be determined with certainty; it is thickish, and depressed at the base, conical, and tapering off posteriorly; its base, above and sideways, is granular, whilst inferiorly may be observed small rhomboid scales, as well as three conical, spine-like processes, forming a group on either side, the points directed backwards; the rest of the organ appears to be covered with verticils of small, elongated, and narrow scales.

The upper regions exhibit a dark reddish-orange ground, over which are distributed, black, elongated patches, contiguous upon their extremities, so as to simulate longitudinal bands or series; these spots are likewise contiguous upon their sides, so as to give somewhat the appearance of transverse interrupted bands. The head and limbs are marmorated with black. Beneath, the color is of a uniform greyish-red or brown. The small spines on the sides of the tail are: the two uppermost, white; the lowermost, black.

Loc.—Brought on board by King Pomare, in March, 1840, while the Expedition was tarrying at the Bay of Islands, New Zealand.

Plate XVIII, fig. 10, represents *Hoplodactylus pomarii*, size of life.
Fig. 11, is the upper surface of the head.
Fig. 12, an inferior view of the same region.
Fig. 13, one toe, seen from above;
Fig. 14, the same, seen from beneath.
Fig. 15, a group of dorsal granules;
Fig. 16, a group of abdominal scales.
Figs. 13–16, are somewhat magnified.

Genus DIPLODACTYLUS, Gray.

Gen. Char.—Back and belly granular. Fingers and toes five, all clawed, truncated at the tip; under surface with a few broad or

roundish plates; with two oval, convex, rather thick ones at the extremity. Tail round or fusiform, with rings of small scales, similar above and below. No femoral or interfemoral pores.

Syn.—*Diplodactylus*, Gray, Proc. of Comm. of Sc. and Corres. of Zool. Soc. Lond. II, 1832, 40; &, Catal. Lizz. Brit. Mus. 1845, 148.—Fitz. Syst. Rept. 1843, 94.—Tsch. Faun. Peruan. 1845, 37.

Observ.—Allied to *Phyllodactylus* by the general structure and conformation of its fingers and toes. This genus differs from the one just alluded to by the absence of large tubercles, intermingled with the dorsal granules, by its cylindrical tail, instead of being depressed, also by the uniformity of its scales above and below. The absence of mental shields is also a feature not to be overlooked when both of these genera are compared together.

Diplodactylus vittatus, Gray.

(Plate XXIV, figs. 9–16.)

Spec. Char.—No mental shields. Three anterior lower labial plates very large; the rest very small. Symphyseal not inclosed by the adjoining labials. An oblique series of three or four small tubercles on each side of the base of the tail. Brown, with a pale dorsal band; sides of the body, limbs, and tail, yellow-spotted. Beneath uniform dull white.

Syn.—*Diplodactylus vittatus*, Gray, Proc. of Comm. of Sc. and Corresp. of Zool. Soc. Lond. II, 1832, 40; &, Catal. Lizz. Brit. Mus. 1845, 148.—Fitz. Syst. Rept. 1843, 94.

Phyllodactylus vittatus, Dum. & Bibr. Erpét. gén. III, 1836, 400.

Descr.—We have before us one specimen of this species, admirably preserved, measuring about three inches and a half from the apex of the snout to the tip of the tail: the head and neck together giving nearly an inch, and the tail, an inch and a quarter.

The head itself is broader than deep posteriorly; the snout tapering into an acute angle, rounded at the summit. The temples are rounded, and the occipital region subconvex, whilst the interocular space is depressed or subconcave, and the snout very declivous side-

ways, as well as anteriorly, giving the portion in advance of the eye a rather wedge-shaped appearance. The mouth is deeply cleft; the gape raised posteriorly, where it approximates the orbits. The eye is large and subcircular: the pupil being likewise circular and very large. The longest, or horizontal diameter of the eye, enters once and a half along the space between the orbit and the extremity of the snout, and twice upon the middle of the interocular region. The auricular aperture is very small and circular.

The rostral plate is subquadrangular, somewhat longer than deep. There are two small and angular internasal plates, in contact with the rostral. The nostrils are lateral, and situated in a recess formed by the first labial plate, the rostral, and the internasal. The upper labial plates are subquadrangular, diminishing gradually in size from the anterior one to the ninth, which is situated opposite the middle of the pupil; these are followed by three or more small subelliptical plates tapering into granules. The symphyseal, somewhat smaller than the rostral, is triangular, with its summit truncated; it is not entirely inclosed by the first pair of lower labials. The latter, number twelve on either side: the three anterior pairs being considerably larger than the rest, which diminish gradually towards the angles of the mouth. There are no mental shields, properly so called: the area adjoining the labial plates exhibits very small, hexagonal, or polygonal plates, whilst the rest of the under surface of the head is minutely granular. The upper surface of the head, between the eyes and the apex of the rostrum, is protected by small, hexagonal, or polygonal plates, whilst the posterior region is minutely granular. The sides and upper surface of the neck are covered with still smaller granules than the head itself.

The body is subcylindrical, apparently deeper than broad, and granular: along the dorsal region, the granules are slightly larger than laterally, increasing somewhat in size along the lumbar region, where they assume the aspect of small polygonal plates. The abdomen exhibits small, hexagonal, or rhombic, granule-like scales, largest upon the interfemoral region.

The limbs are quite slender: the anterior pair still more so than the posterior pair; their upper surface, to the very tip of the toes, is covered with granules similar to those of the body; and, their inferior surface, the fingers and toes not included, exhibit the same granule-like scales observed on the abdomen. The fingers and toes are

unequal; the inner ones smallest, truncated upon their extremity, where a slender and curved nail may be seen, situated in a small groove. All along the middle of their inferior surface are distributed small, transversely elongated, or subcircular plates, two of which, rather thick and convex, occupying symmetrically the extremity, one on each side of the nail. These subdigital plates are more or less regularly arranged, with intervening minute granules.

The tail is subcylindrical, fusiform, tapering into a point, and covered with small, angular, polygonal scales, disposed upon circular series, subequal and similar above and below.

The color is brown above, with a dorsal pale or yellowish band or streak, subbifurcated upon the occiput, where broadest, and extending to the base of the tail. A stripe of rather dark brown, extends from the sides of the head along the margin of the dorsal streak. The rest of the sides of the body and upper surface of the limbs is dotted with yellow. The upper surface of the tail exhibits a double series of pale spots surrounded with black dots. Beneath, the color is of a uniform dull white, or light olive.

Loc.—Southeastern Australia.

Plate XXIV, fig. 9, represents *Diplodactylus vittatus*, size of life.
Fig. 10, is an upper view of the head;
Fig. 11, its profile; and,
Fig. 12, an under view of the same region.
Fig. 13, is the left hand, from above;
Fig. 14, the same hand, from below.
Fig. 15, a group of dorsal granules;
Fig. 16, a group of abdominal scales.
Figs. 10–16, are somewhat magnified.

Genus DISCODACTYLUS, Fitz.

Gen. Char.—Fingers and toes five, free, subcylindrical, clawed, with one series of small plates beneath, and dilated at the apex into a double disk, separated beneath by a groove, in which the claw is situated. Palms and soles granular. Body moderately elongated; limbs well developed. Neither femoral nor preanal pores. Tail

more or less elongated. Back covered with granules and tubercles. Abdomen scaly.

SYN.—*Discodactylus*, FITZ. Syst. Rept. I, 1843, 95.—TSCH. Faun. Peruan. 1845, 38.

OBSERV.—The species of this genus are still united with those of *Phyllodactylus* by some modern writers. If the generic characters attributed to them are constant, there is no reason why *Discodactylus* should not be adopted.

DISCODACTYLUS PHACOPHORUS, Tsch.

(Plate XXV, figs. 25–32.)

SPEC. CHAR.—Upper surface of head granular. Two small, internasal, tubercular plates, not contiguous upon the medial line of the rostrum. Mental shields small. Twelve dorsal series of small tubercles: six on either side. Ground color olive-green, above marmorated with black; beneath lighter, and unicolor.

SYN.—*Discodactylus phacophorus*, TSCH. Faun. Peruan. Herp. 1845, 38.

DESCR.—The species is apparently one of small size: the largest specimen which we have examined measuring but one inch and three-fourths, from the tip of the snout to the vent: the tail being about equal to the head and trunk combined. The head is proportionally large, elongated, depressed, tapering anteriorly into an acute, triangular, wedge-shaped snout. The neck is somewhat contracted, and the body depressed, convex above, and flat beneath. The upper surface of the head is subdepressed along its middle, and granular, more coarsely so than the body. Upon the region in advance of the eyes, the granules are larger still than on the occiput, interocular region, and temples. The nostrils are lateral, situated just above the commissure between the rostral plate and first labial; and, superiorly, upon the internasal space, may be seen two small, tubercular plates, one above each nostril, and contiguous to the rostral plate, but sometimes separated from each other upon the middle region of the snout, especially in the adult. Immediately behind the nostrils, are

one or two granules, occasionally a little larger than the rest. The rostral plate is but moderately developed, somewhat longer than deep, superiorly convex, and incised upon its middle, which corresponds to the depression of the cephalic region at large. Nine upper labial plates may be observed on either side, longer than deep, subquadrangular in shape, diminishing gradually to the sixth: the three last being quite diminutive. The symphyseal plate is larger than the rostral, prolonged beneath the chin, beyond the first pair of labials, and therefore not inclosed by the latter; it is either pentagonal or hexagonal, under the general shape of an acute triangle whose summit is directed backwards. The lower labials are seven on either side: the three anterior considerably larger than the rest; all diminishing in size posteriorly; the anterior two pairs being deeper than long; the rest, longer than deep. Two small, angular, mental shields, may be observed, one on each side of the symphyseal, contiguous to the labials; there may be an odd small plate connecting the two, in contact with the apex of the symphyseal. Lining the labials and mental shields, are some very small plates irregularly arranged, whilst the rest of the inferior surface of the head is covered with minute granular scales. The eyes are subcircular and well developed, with a vertical pupil. The auricular apertures are very small, and vertically elliptical.

The surface of the neck and body is minutely granular, with twelve longitudinal series of small, subtriangular, depressed, and carinated tubercles, extending from the occiput to the base of the tail. The chest and abdomen are protected by subelliptical, smooth scales, of moderate development, arranged upon regular series, and scarcely larger upon the interfemoral region, which exhibits no pores at all.

The limbs are quite slender, though proportionally long; they are covered with small, somewhat irregular scales to the very extremity of the fingers and toes, except on the posterior aspect of the arms, thighs, over the palms and soles, which are granular. The inferior surface of the fingers and toes is provided with a series of small, tubercular plates, either circular or transversely elliptical; at their dilated extremity are two thin, dilated, longitudinally subelliptical plates, between which is a notch or groove, where a minute and inconspicuous nail is inserted. The tail is conical, slender, simple, and tapering into a point, protected by small, subrhomboid, conspicuously carinated, and verticillated scales: the keel stretching beyond their posterior margin.

The colors, as preserved in alcohol, are: deep brown markings, upon a light brown ground. A sketch made from life, in July, 1839, exhibits an olive-green ground, a streak of which may be traced along the middle of the back. The head, the body, and the limbs are variously mottled with black: in sinuous lines on the head; simulating transverse bands, posteriorly tipped or edged with white, along the back; in longitudinal broken-up streaks on the sides of the head and lateral region of the body; in transverse bars upon the limbs; and, in obsolete half rings along the tail. A conspicuous black streak is observed from the posterior rim of the orbit to the upper edge of the auricular aperture. The labial plates are dotted with white, as also the upper portion of the eyelid. White dots seem likewise to exist on the sides of the body. Beneath, the hue is lighter and unicolor.

Loc.—Found under stones, on the Amancaes Mountains, Peru.

Plate XXV, fig. 25, represents *Discodactylus phacophorus*, size of life.
Fig. 26, is an upper view of the head;
Fig. 27, a profile; and,
Fig. 28, an under view of the same region.
Fig. 29, is the left hand, from above;
Fig. 30, the same hand, from beneath.
Fig. 31, a group of dorsal granules and tubercles;
Fig. 32, a group of abdominal scales.
Figs. 26–32, are somewhat magnified.

Genus PHYLLURUS, Cuv.

Gen. Char.—Back and tail granular, with scattered, larger tubercles; belly covered with very small scales. No preanal or femoral pores. Sides with a slight fold of the skin. A few small, internasal plates. No mental shields. Limbs long and slender. Fingers and toes slender, unequal, subcircular, compressed, all clawed, with bent joints, and cross-plates beneath. Tail broad, depressed, contracted at the base, tapering towards the tip.

Syn.—*Phyllurus*, Cuv. Règn. Anim. II, 1817, 50; 2d ed. II, 1829, 58; &, ed. illustr. Rept. 81.—Fitz. Syst. Rept. 1843, 92.—Gray, Catal. Lizz. Brit. Mus. 1845, 176.

Observ.—This genus is not generally admitted by naturalists, who combine its species with *Gymnodactylus*. The configuration of the tail was taken as its chief distinguishing feature by Cuvier, who proposed it. There are other traits now to be adduced in favor of retaining it in the system, and accordingly, we think it ought to be reinstated.

Phyllurus platurus, Cuv.

Spec. Char.—Nostrils lateral, not contiguous with either the rostral or labial plates. Two small supero-nasal plates: the anterior one contiguous to the rostral. Internasal space covered with small, granular, subhexagonal plates. Upper surface of head granular and tubercular; under surface of head minutely granular. Tail smooth beneath, with small, subhexagonal scales. Olivaceous-brown, lighter beneath than above.

Syn.—*Lacerta platura*, Shaw, in *White's* Journ. Voy. to N. S. Wales, 1790, 246. Pl. xxxiii, fig. 2; Nat. Miscell. II, 1791. Pl. lxv; &, Gen. Zool. III, 1802, 247.

Stellio phyllurus, Schn. Amphib. Physiol. Spec. II, 1790, 31.

Stellio platurus, Daud. Hist. Rept. IV, 1802, 24.

Agama platyura, Merr. Tent. Syst. Amph. 1820, 51.

Agama discosura, Merr. Tent. Syst. Amph. 1820, 51.

Phyllurus platurus, Cuv. Règn. Anim. 2d ed. II, 1829, 58; &, ed. illustr. Rept. 81. Pl. xx bis, fig. 2.—Guer. Iconogr. Règn. Anim. I, 1834. Pl. xiv, fig. 1.—Griff. *Cuv.* Anim. Kingd. IX, 1831, 151.—Fitz. Syst. Rept. 1843, 92.—Gray, Catal. Lizz. Brit. Mus. 1845, 176.

Gymnodactylus platurus, Wagl. Naturl. Syst. Amph. 1830, 144.

Cyrtodactylus platurus, Gray, Synops. Rept. in *Griff.* Anim. Kingd. IX, 1831, 52.

Gecko platicaudus, Schinz. Naturg. Abbild. Rept. 1833, 75. Tab. xvii.

Gymnodactylus phyllurus, Dum. & Bibr. Erpét. gén. III, 1836, 428.—Journ. Navig. Thétis & Espér. 1837, Pl. xliii.

Phyllurus cuvieri, Bory, Dict. Class. d'hist. nat. VII, 1825, 183 (fig.).

Lézard discosure, Lacep. Ann. Mus. d'hist. nat. IV, 1804, 191.

Observ.—This species, owing to its uncommon aspect, has often attracted the attention of naturalists and iconographists, so that we may say that it is pretty generally well known. It is well repre-

sented in the Atlas of the "Journal de la Navigation Autour du Monde de la frégate la Thétis et de la corvette l'Espérance, by Captain Bougainville," as also in several other works, referred to in the synonymy, in which its description may likewise be found. We might enlarge upon this subject, had we had at our command *Phyllurus inermis* and *P. miliusii*, both belonging, apparently, to the same genus.

Loc.—Specimens were procured in Southeast Australia: they were found about rocks, in the Botanic Garden of Sydney.

Genus GONIODACTYLUS, Kuhl.

Gen. Char.—Back granular, with scattered or serial tubercles. Belly covered with six-sided or elliptical, smooth scales. Males with two parallel longitudinal rows of interfemoral pores. One pair of mental shields. Lower labials numerous. Fingers and toes very slender, much compressed, elongated, with cross-plates beneath. Tail cylindrical, tapering, ringed, with cross-series of tubercles.

Syn.—*Goniodactylus*, Kuhl, MS.—Wagl. Naturl. Syst. Amph. 1830, 144.—Schleg. Abbild. Amph. 1838.—Fitz. Syst. Rept. 1843, 92 & 93.

Observ.—The limits here assigned to this genus do not appear to us altogether satisfactory, the scarcity of materials not having permitted extending our investigations.

Goniodactylus marmoratus, Kuhl.

Spec. Char.—Nostrils lateral, situated above the first labial plate. Two pairs of internasals: anterior one largest, and interposed between the rostral and the nostril. Small tubercles scattered over the posterior part of the head, back, sides, limbs, and tail. A triangular symphyseal, inclosed by a pair of subtrapezoid mental shields. Brown, marmorated above with black; beneath unicolor.

Syn.—*Goniodactylus marmoratus*, Kuhl. MS.—Schleg. Abbild. Amph. 1838. Tab. II.

Cyrtodactylus marmoratus, Gray, Synops. Rept. in *Griff.* Anim. Kingd. IX, 1831, 51; &, Catal. Lizz. Brit. Mus. 1845, 173.

Gymnodactylus marmoratus, Dum. & Bibr. Erpét. gén. III, 1836, 426.

Observ.—The unique specimen of this species which we have had an opportunity of examining, measures an inch and a half, the tail not included: it is therefore immature. The adult has been well illustrated by Schlegel.

The rostral plate is small and subpyramidal; immediately behind it, is a pair of subquadrangular internasals, contiguous upon their medial line, and extending also in advance of the nostrils, so as to officiate as prenasals, preventing the nostrils from approaching the rostral. A quite small pair of flattened supero-nasals may be observed, separated on the middle line of the rostrum, though contiguous to the anterior pair. A small, odd plate may also be observed at the commissure of the large internasals. There are ten upper labials on either side, quadrangular, longer than deep, and diminishing gradually posteriorly. The symphyseal is small and subtriangular, inclosed posteriorly by a pair of subtrapezoid, mental shields. Small, slender, elongated plates may be seen lining the lower labials, which are ten or eleven on each side, diminishing backwards; the five anterior considerably larger than the rest.

With the above few remarks we must dismiss this species, regretting that we had no adult specimen to enable us giving an elaborate description of it.

Loc.—Mangsi Island, Philippine Group.

Genus HETERONOTA, Gray.

Gen. Char.—Symphyseal plate very large, and two small, mental shields. Back granular, with longitudinal series of angular tubercles. Belly protected by small, ovate, and keeled scales. Males with minute, interfemoral pores, disposed upon an arched series. Fingers and toes unequal, very slender, compressed, versatile, with cross-plates beneath. Tail subcylindrical, tapering, with cross-series of keeled scales.

Syn.—*Heteronota*, Gray, Catal. Lizz. Brit. Mus. 1845, 174.

Observ.—This genus is closely allied to *Cyrtodactylus*, from which it differs by the presence of keeled scales on the abdomen and around the tail. The great development of the symphyseal plate was considered as its chief feature by John Edward Gray, by whom it was instituted.

Heteronota pelagica, Grd.

(Plate XXIV, figs. 25–32.)

Char. spec.—*Naribus lateralibus, super commissuram inter scutum rostralem et primum labialem sitis. Scutis internasalibus duobus, quadrangularibus et contiguis; scuto postnasali minimo, tuberculiformi. Scutis mentalibus duobus, parvis. Tuberculis dorsualibus in duodeviginti series longitudinales ordinatis. Supra fusca, nigro maculata; infra unicolori.*

Spec. Char.—Nostrils lateral, situated above the commissure between the rostral plate and the first labial. One pair of quadrangular internasals, contiguous, and a small, tubercular postnasal. One pair of small mental shields. Eighteen longitudinal series of tubercles. Brown, maculated above with black; beneath unicolor.

Syn.—*Heteronota pelagica*, Grd. in Proc. Acad. Nat. Sci. Philad. November, 1857.

Descr.—The head is depressed, subovoid when viewed from above; the neck is contracted, and the body depressed also, broader than deep. The tail is elongated, subcylindrical, tapering into a point, and nearly as long as the body and head together. The rostral plate is subquadrangular, slightly longer than deep, subconcave upon the middle of its upper edge; the nostrils are situated in a little depression, immediately behind its upper angle, contiguous beneath to the commissure of the first labial; above, it is limited first, by a pair of subquadrangular internasal plates, which are contiguous upon the middle line of the rostrum, and secondly by a quite small, tubercular postnasal, which is contiguous to the internasal. There are ten upper labials, longer

than deep: the five anterior are well developed; all diminishing in size posteriorly. The symphyseal is much larger than the rostral, subpentagonal or subtriangular, and produced under the chin, beyond the labials; its posterior extremity is not surrounded by any plate. Two very small mental shields may be observed, one on each side, and not contiguous to the labials, from which they are separated by the minute and uniform granules observed all over the inferior surface of the head. The lower labials are eight on either side: the first pair being a little smaller than the second and third; the four anterior pairs considerably larger than the rest, are longer than deep. The eyes are subelliptical and well developed, whilst the auricular aperture is small and subcircular. The upper surface of the head is granular, finely so upon its posterior portion, including the temples, and over which the tubercles extend, and more coarsely anteriorly, where the granules become scale-like, exhibiting at the same time, traces of carination. Similar, carinated, scale-like granules may be observed upon the cheeks, between the eye and the ear, and under the jaws and neck also. The sides of the upper surface of the neck are granular and tubercular. The granules over the back and sides are pretty uniform, mayhap, not quite so crowded upon the sides, and somewhat smaller. The tubercles themselves are nearly equal, except towards the head and neck, where they are somewhat smaller; they constitute eighteen longitudinal series, nine on either side, across the middle region of the body; they diminish in number as they approximate the tail, beyond the base of which they do not extend. In shape, they are subconical or subtriangular, their surface being distinctly striated. The granules themselves appear striated. The chest and belly are covered with uniform ovate scales, with a few larger ones upon the interfemoral region, all distinctly keeled.

The limbs are slender; their surface is covered with small, scale-like, and keeled granules, with scattered tubercles over the posterior pair. The axillae, groins, palms, and soles are finely granular. The posterior aspect of the thighs exhibits these tubercles in the midst of minute granules. The upper surface of the fingers and toes is minutely granular; their under surface being provided with transverse thickish plates.

The tail is protected by subhexagonal and conspicuously keeled scales, larger than on the abdomen, and arranged upon circular series, else subverticillated.

The ground color is of a deep brown, maculated with black, so as to simulate transverse, undulating, dark bands over the back and limbs, longitudinal streaks over the head and neck, and half rings over the tail: the posterior margin of these dark bands or patches being light-lined. The commissures of the labial plates are whitish, as well as the upper aspect of the phalanges. Beneath, the color is uniformly brown.

Loc.—Feejee and Navigator Islands.

Plate XXIV, fig. 25, represents *Heteronota pelagica*, size of life.
Fig. 26, is the head seen from above;
Fig. 27, its profile; and,
Fig. 28, an under view of the same region.
Fig. 29, the left hand, from above;
Fig. 30, the same hand, from below.
Fig. 31, a group of dorsal granules.
Fig. 32, a group of abdominal scales.
Figs. 26–32, are somewhat magnified.

Genus NAULTINUS, Gray.

Gen. Char.—Body of moderate length, stoutish, and depressed. Back granular or subgranular; abdomen protected by very small and smooth scales. Head depressed, rather broad posteriorly, and granular, subconical anteriorly, and covered with small, roundish, or subhexagonal plates. Pupil vertical. Nostrils lateral, subterminal. Auricular aperture moderate, simple. Labial plates diminishing posteriorly, not extending to the angle of the mouth. No mental shields. Chin and throat minutely granular. Limbs moderately developed. Fingers and toes five, unequal, tapering, clawed, depressed, except the last joint, which is compressed; protected beneath by transverse and simple plates. Tail well developed, subcylindrical, depressed, posteriorly tapering, superiorly granular, scaly beneath, provided, on each side of its base, with two or four spine-like scales. Femoral pores disposed upon one or two series; interfemoral pores in patches or ogees.

Syn.—*Naultinus*, Gray, Zool. Misc. 1842, 72; in *Dieff.* Trav. into N. Zeal. II, 1843, 202; &, Catal. Lizz. Brit. Mus. 1845, 169.
Kakariki, Natives of New Zealand.

Observ.—Whether *Naultinus elegans* and *N. graii* are really distinct from one another, as well as from the species described further on, we are not prepared to tell from direct observations. They are, at any rate, very closely allied, all of which being, so far as known, natives of New Zealand. Their coloration assumes various shades of green, sometimes purplish or pinkish, with paler spots.

The brown species alluded to in the "Catalogue of Specimens of Lizards in the Collection of the British Museum," have been transferred to the genus *Hoplodactylus*.

The genus *Naultinus* is a Stenodactylian: hence, widely distinct from *Hoplodactylus*, which, as already stated, is a Platydactylian.

Naultinus punctatus, Gray.

(Plate XVI, figs. 17–26.)

Spec. Char.—Femoral pores disposed upon a double series; interfemoral pores, upon a large patch. Four ovate, subconical scales, on either side of the base of the tail, arranged upon an oblique series. Bright green, with very small, scattered, black specks.

Syn.—*Naultinus punctatus*, Gray, in *Dieff.* Trav. into N. Zeal. II, 1842, 204; &, Catal. Lizz. Brit. Mus. 1845, 170.

Descr.—The general aspect of this species is rather short and thickish, than slender and elongated. The head is very much depressed, very broad across the temporal regions, tapering towards the snout, under the shape of an acute triangle when viewed from above. The neck is somewhat contracted, and the body depressed, much broader than deep, especially in full-grown specimens. The legs are stoutish, though rather short; the anterior pair being nearly as large as the posterior pair. The tail is elongated, subconical, slightly depressed, and longer than the body and head together.

The rostral plate is quite low, much longer than deep, incised upon its upper margin, and occasionally entirely subdivided into two labial-like plates. The upper labials, themselves, are from eleven to thirteen on either side, deeper than long, subconvex upon their upper edge, and diminishing gradually in size posteriorly, the last one corresponding to a vertical line drawn within the posterior rim of the orbit. The anterior pair is a little lower than the second and third, as though the position of the nostril, immediately above its upper edge, encroached somewhat upon it. The nostril itself is subcircular, directed obliquely backwards and outwards, and, since it rests upon the anterior labial, needless to say that it is lateral. A small, subtrapezoid prenasal, interposes itself between said aperture and the rostral, extending likewise to the internasal space, without, however, coming into contact with its fellow, from which it is separated by a small hexagonal plate. A few, very small, and irregular plates, complete the rim of the nostril superiorly and posteriorly. Upon the fronto-nasal space may be observed small, generally hexagonal plates, extending also laterally to the loral region, forming sometimes a larger series along the canthus rostralis. The eye is subcircular, of moderate size, its pupil being vertical, and the eyelid constituting a complete circular ridge, covered with small granules. The symphyseal plate is nearly equal to the rostral in size, though deeper and narrower upon its buccal margin. The lower labials are eleven or twelve on either side, shaped like the upper ones, though more developed, deeper than long, and diminishing gradually posteriorly: the anterior pair does not extend inferiorly beyond the symphyseal, which is not inclosed by them; the posterior pair corresponds to the last upper labial. There are no mental shields, properly so called. A few small, subhexagonal plates may be observed under the chin. The inferior surface of the head is covered with subequal, granular scales; the upper surface of the head is likewise granular, but the granules are unequal, and coarser than on the body. The sides of the neck appear to be obscurely and irregularly folded, and finely granular all around. The auricular aperture is rather small and subcircular. The surface of the body is protected by subequal granules, subconvex along the dorsal region, and flattened upon the sides. The belly exhibits small, subrhomboid, or angular scales. A double series of femoral pores may be traced along the thighs, merging into an interfemoral group, transversely elongated, but not triangular. The scales perforated by these pores are somewhat larger than the

rest. The limbs are covered with scale-like granules, or granular scales, as the case may be; and the upper surface of the fingers and toes, with subimbricated small scales; whilst their under surface is protected by transverse, thin, and narrow plates: their margins appear denticulated or serrated by the raising of the scales adjoining the plates. Four ovate, subconical scales, are disposed upon an oblique series on each side of the base of the tail. The tail itself is granular above, like the back, and scaly beneath, like the belly.

The color of the largest specimen is bright green above (dark green in spirits), and yellowish-green beneath, with very small, black specks, one upon the centre of the granules or scales, as the case may be, though not upon each one, and more conspicuous on the belly than on the back. A somewhat smaller specimen (altered) is pinkish above, and pale beneath, with a white streak on each side of the crown. Other specimens, still smaller (altered), are likewise pinkish above, and pale beneath, exhibit, on each side of the back, three or four distant, ovate, white spots, besides the white streaks over the crown. The side of the head is also of a pale hue.

Loc.—Bay of Islands, New Zealand. Brought on board by the natives; hence the inference that the animal is rather rare.

Plate XVI, fig. 17, represents *Naultinus punctatus*, size of life.
Fig. 18, is an upper view of the head;
Fig. 19, an inferior view of the same.
Fig. 20, a finger, seen from above;
Fig. 21, the same, seen from beneath.
Fig. 22, a toe, seen from above;
Fig. 23, the same, seen from beneath.
Fig. 24, the caudal group of conical scales.
Fig. 25, a group of dorsal granules.
Fig. 26, a group of abdominal scales.
Figs. 18–26, are somewhat magnified.

Fam. IGUANIDAE.

The group of which we are now to speak, is one which embraces numerous genera and species, largely represented in the collection made by the Expedition.

The characters by which it may be distinguished from the other Saurians, consist in the exclusive presence of scales, either smooth or carinated, imbricated or not imbricated, covering the entire body, limbs, and tail, and, in most cases, provided with a dorsal crest, more or less developed: the abdomen being protected by scales similar in shape and structure to those of the back, instead of those large, subquadrangular plates, or scutellae, observed in the Crocodiles, Varanids, and others. The body itself is either compressed or depressed. The upper surface of the head exhibits small, polygonal plates, instead of large shields, or small, granular scales. The maxillary teeth are not driven into the bones, but placed either in a groove or common socket, else soldered to the edge of the bones themselves. The palate is either toothed or toothless. The tongue is thick, depressed, fungous; its surface is velvet-laced, its apex free, and not retractile into a sheath; the eyes being large, protected by movable lids. The auricular apertures are generally present, and wanting in a few genera. The fingers and toes are always free, distinct, not palmated, all of which provided with a claw or nail.

Syn.—*Iguanoides*, Oppel, Reptil. Prodr. 1811.

Iguaniens, Cuv. Règn. Anim. II, 1817, 29; 2d ed. II, 1829, &, ed. illustr. Rept. 46.—Dum. & Bibr. Erpét. gén. IV, 1827, 1.

Iguanina, Bonap. Sagg. Distr. Anim. Vertebr. 1830.

Stellionina, Bonap. Saggio, Dist. Anim. Vertebr. 1830.

Stellionidae, Bonap. Sagg. Distr. Anim. Vertebr. 1830.

Iguanidae, Gray, Synops. Brit. Mus. 1840; &, Catal. Lizz. Brit. Mus. 1845, 178.

Eunotes, Dum. & Bibr. Erpét. gén. IV, 1837, 1.

Stelliones, Fitz. Syst. Rept. I, 1843.

The family of Iguanids, as above characterized, is subdivided into two natural groups or subfamilies, according as to whether the teeth are received into a common groove upon the edge of the jaws, or else strongly soldered to these very bones: the representatives of the former inhabit the Old World; those of the latter, the New World.

Subfam. PLEURODONTES.

The teeth are inserted upon the inner edge of a groove carved in the jaw bones. The body is either depressed, broader than deep, or compressed, and deeper than broad. Some genera are provided with a dorsal crest, which is wanting in others. The same is true with the palatine teeth, which are present in some, and absent in others.

Syn.—*Pleurodontes*, Wagl. Naturl. Syst. Amph. 1830, 147.—Dum. & Bibr. Erpét. gén. IV, 1837, 33 & 46—Dum. & A. Dum. Catal. méth. Rept. Mus. d'hist. nat. i, 1851, 54.

Observ.—The genera of this group are differently distributed in the method by the authors just quoted, although they essentially agree upon the structural character above referred to: the difference arising from the fact that Wagler subordinates the dentition to the general shape of the body, which is either broader than deep or depressed (*Platycormae*), or deeper than broad or compressed (*Stenocormae*). Now, we will find that there are Pleurodonts and Acrodonts amongst both the Platycorms and Stenocorms.

Genus MICROLOPHUS, Dum. & Bibr.

Gen. Char.—Head subpyramidal, subquadrangular, depressed, covered with unequal, smooth plates. Occipital plate well developed; supraocular plates large. Nostrils lateral, rather tubular, situated above the canthus rostralis. Palatine teeth extant. Auricular aperture denticulated in front. Several cross-folds under the neck, and an arched fold before each shoulder, meeting on the chest. Body elongated, subdepressed, rather rounded, with two longitudinal folds on either side. Scales small, subimbricated, slightly keeled, or smooth on the back; larger, imbricated, and smooth on the belly. Nape, back, and tail with a very low, serrated, or tubercular crest. Tail long, subconical, covered with subverticillated, carinated, and rather large scales. No femoral pores. Five fingers and five toes, unequal, clawed.

Syn.—*Microlophus*, Dum. & Bibr. Erpét. gén. IV, 1837, 334.—Gray, Catal. Lizz. Brit. Mus. 1845, 221.—Guich. in *Gay*, Hist. de Chile, Zool. II, 1848, 47.—Dum. & A. Dum. Catal. méth. Rept. Mus. d'hist. nat. i, 1851, 80.

Steirolepis, Fitz. Syst. Rept. 1843, 72.—Tsch. Faun. Peruan. Herp. 1845, 29.

Observ.—This genus represents, as it were, in the New World, that of *Brachylophus*, of the Old: both belonging rather to the Austral, than Boreal Hemisphere. The species it is intended to include not having been satisfactorily examined, there is some controversy as to their actual number. Fitzinger adopts six species, three from Peru, and three from Brazil. We have not had an opportunity to examine any specimens of the Brazilian species; of the Peruvian ones, the Expedition brought home a series of individuals, all identical with *Stellio peruvianus* of Lesson. Duméril & Bibron admit the existence of but one species in Peru. Tschudi, himself, who, of all herpetologists, was most likely to have given us accurate information in that respect, renders their history still more confused by establishing four other species upon the coloration alone, under the names of *Steirolepis xanthostigma*, *S. tigris*, *S. thoracica*, and *S. quadrivittata*, all from the coast of Peru.

Microlophus peruvianus, Gray.

Spec. Char.—Scales on the dorsal region somewhat larger than laterally. Nostrils approximating the apex of the snout. Inframaxillar shields well developed. Tail longer than the body and head together. Color olivaceous, speckled, and variegated with black; a white or black lateral streak. Under surface of head black, else exhibiting angular black lines; rest of the under surface, unicolor.

Syn.—*Stellio peruvianus*, Less. Voy. de la Coq. Zool. II, i, 1830, 40. Pl. ii, fig. 2.

Tropidurus heterolepis, Wiegm. Act. Acad. Nat. Cur. XVII, i, 1835, 225. Pl. xvii, fig. 1.

Microlophus lessonii (in part), Dum. & Bibr. Erpét. gén. IV, 1837, 336.—Guich. in *Gay*, Hist. de Chile, Zool. II, 1848, 48.

Steirolepis peruvianus, Fitz. Syst. Rept. 1843, 73.—Dum. & A. Dum. Catal. méth. Rept. Mus. d'hist. nat. i, 1851, 81.

Microlophus peruvianus, Gray, Catal. Lizz. Brit. Mus. 1845, 221.

Observ.—It is stated, by some systematic writers, that this species is subjected to variations, not only in its mode of coloration, but even

in several of its structural peculiarities, such as the cephalic plates, which would be either smooth and not imbricated, or slightly carinated and subimbricated, and also the dorsal crest, which would nearly disappear from the middle region of the body. We have examined four specimens, young and adult, all agreeing in the following particulars :

Descr.—The cephalic plates are smooth, subconvex, polygonal, unequal, and not imbricated; the largest ones (the occipital excepted), may be seen upon the frontal and supraocular regions; transversely elongated upon the latter region, from four to six in number, and disposed upon a curvilinear series; upon the frontal region, they are more or less symmetrically arranged, right and left, and irregular in their outlines. The occipital plate is quite large and conspicuous. A curvilinear series of moderate plates is observed on each side of the occipital, extending from the posterior upper angle of the orbit to the frontal region, passing between the eyes, where they meet, occupying all the interocular region. The occipital, posteriorly and sideways, is surrounded by small plates, constituting but one series behind, whilst laterally, the same small scales extend over the temporal regions, and a group of them may even be observed anteriorly, in a subtriangular area, formed by the curvilinear series just alluded to. A similar curvilinear series of small plates borders interiorly the supraoculars, already mentioned, whilst the anterior and exterior areas of the supraocular region, not occupied by the large plates, are covered with similar small plates. The supraciliary plates are narrow and elongated, five or six in number, smallest anteriorly. The nasal plates are of moderate development: those which the nostrils perforate are the most conspicuous, and situated near the apex of the snout, just above a line which would be the prolongation of the supraciliary ridge, and separated from the rostral by a circle of minute plates. The nostrils themselves are tubular, and directed outwardly backwards. As to the rostral plate it is quite low, horizontally elongated, and convex or subconvex above. The upper labials are narrow and elongated, ten in number: the seven anterior increasing in size backwards, and followed by three quite small and irregular ones, beneath which a series of minute plates is observed. One series of supralabials is likewise to be seen, resembling the labials, diminishing backwards, though not extending beyond the anterior third of the orbit. The phrenic region is protected by a few plates of moderate development. The sub-

orbital ridge is composed of an anterior small plate, of a second, long and curvilinear, occupying most of the region beneath the eye; then come two very small plates, which end the series, nearly opposite the posterior edge of the orbit. Upon the surface and on the edge of the eyelids, the plates assume a granular aspect. The auricular apertures are large and subtriangular: their anterior margin being provided with projecting and slender scales, which give to it a denticulated or serrated appearance. The inferior surface of the head is covered with small, subequal, elliptical, and smooth scales. The lower labials are somewhat larger than the upper, otherwise similar in form and disposition. The symphyseal is subtriangular or subpentagonal, deeper, though a good deal shorter, than the rostral. The mental shields are numerous and well developed, constituting two diverging series, one under the branch of each jaw; they diminish in size backwards. Between the lower labials and mental shields, may be observed one or more series of infralabials. Upon the transverse folds of the neck, the scales are granular, whilst upon the angular pectoral fold, they are flat, subrhombic, resembling those of the abdominal region.

The body is elongated, somewhat depressed, and rounded. Two longitudinal folds of the skin may be seen on each side: the uppermost extending from the auricular aperture to the base of the tail; the lower one, from the axilla to the groin. The upper surface and sides of the neck, the lateral regions of the body, and the posterior surface of the arms and thighs, are covered with crowded granular scales. Upon the dorsal region, properly so called, there is a longitudinal area, where the scales, though very small, are flattened, subcircular or subrhombic, slightly or conspicuously carinated, disposed on each side of the dorsal crest, itself composed of small, convex, subequal, and carinated scales, extending from the nape to the anterior third of the tail, smaller on the nape, and gradually increasing posteriorly. The abdominal scales are subequal and smooth, larger on the middle region than on the sides, towards which they gradually diminish; they are subrhombic anteriorly, and subcircular posteriorly, disposed upon transverse series.

The anterior limbs are rather small and slender; when stretched alongside the body and bent backwards, the extremities of the fingers hardly reach the groins. The posterior limbs are more developed, and, when brought forwards, the extremity of the longest toe may reach the orbit; their upper surface is covered with subrhombic and carinated

scales, a good deal larger than those of the dorsal region, larger also around the forearm and leg than on the arm and thigh; they are nearly alike on the carpus and tarsus, palm of the hands, and sole of the feet; the only differences observed consist in being more or less elongated and more or less developed: they are conspicuously smaller on the palm of the hands. Under the thighs and legs, the scales resemble in shape those of the abdominal region, as well as in being smooth; they are very small upon the interfemoral region and about the vent also. The fingers and toes are subcircular or subcompressed, scaly all around, crested beneath, owing to the projection of the keels beyond the edge of the scales. The nails are compressed, curved, and acute. The tail is elongated, subconical, and tapering into a point, somewhat depressed anteriorly. It is protected by rather large, subverticillated, and conspicuously carinated scales, except under its anterior third, where they are smooth; rhombic or subrhombic at the base, they become subtrapezoid posteriorly, and finely lanceolated towards the last third of its length.

As to the coloration, we observe that the upper regions, in the male, are of a very dark olive, without scarcely any spots or other markings, whilst in the female, the ground hue is a good deal lighter, and over which are scattered black and white specks, largest upon the limbs and tail: the upper surface of the head being unicolor. The inferior regions are of a uniform light tint, except under the head, where angular dark lines are observed, conspicuous and distinct in the female, confluent in the male, so as to give to that region an almost uniform dark appearance. The zone between the lateral folds of the body, is posteriorly jet-black in some specimens, and yellow or white in others.

Loc.—Peru. "Small specimens were taken as far in the interior as the hills about Lima; but, we found it most common, and the largest and finest specimens, about the stones on the top of the beach, near the mouth of the Rimac. Lima specimens had oval spots on the back."

Genus TARAGUIRA, Gray.

Gen. Char.—Head depressed, subtriangular from above, covered with unequal plates, with a rather large occipital, and moderate supraoculars. Nostrils lateral, situated immediately above the rostral ridge, and directed outwardly backwards. A transverse fold under

the neck, and one in advance of the shoulders. Teeth on the palate. Auricular aperture anteriorly serrated; tympanum visible. Body elongated, depressed, without lateral folds, and covered with small, imbricated scales, keeled on the back, and disposed upon series converging towards the dorsal line, which is not crested. Abdominal scales smooth. Tail elongated, stout at the base, where depressed, conical posteriorly, protected by rather large, keeled scales: the medial series being slightly crested. Limbs of moderate development; fingers and toes unequal. No femoral pores.

Syn.—*Taraguira*, Gray, Catal. Lizz. Brit. Mus. 1845, 219.

Ecphymotes, Cuv. (non Fitz.), Règn. Anim. 2d ed. II, 1829, 47.—Dum. & Bibr. Erpét. gén. IV, 1837, 342.—Dum. & A. Dum. Catal. méth. Rept. Mus. d'hist. nat. I, 1851, 81.

Observ.—Since *Ecphymotes*, of Fitzinger and Cuvier, appear to be distinct genera, and that the former author has the priority over the latter, we must necessarily adopt *Taraguira*, in order to preserve an intelligible nomenclature.

Taraguira torquata, Gray.

Spec. Char.—Either olive or greenish-brown above, spotted with black or olive; a pale streak on each side of the back, more or less apparent. A white-edged, black, vertical band in advance of the shoulder. Chin variegated with irregular dark lines or spots, upon a light ground. Throat generally blackish. Belly and under surface of limbs and tail unicolor, yellowish, except in the male sex, in which a zone of small, black spots, may be seen under the thighs; each scale bearing one of these spots.

Syn.—*Stellio torquatus*, Maxim. Naturh. Reise, in Bras. I, 1817, 139; &, Beytr. Naturg. Bras. I, 1825, 39.

Tropidurus torquatus, Maxim. Rec. Pl. Col. Anim. Brés. 1822.—Fitz. Neue Clas. Rept. 1826, 49.—Wagl. Naturl. Syst. Amph. 1830, 147.—Gray, Synops. Rept. in *Griff.* Anim. Kingd. IX, 1831, 41.—Wiegm. Herp. Mex. 1834, 18.—Gravenh. in Act. Nat. Cur. XVIII, II, 1838, 754. Pl. LVI, figs. 13–16.

Agama tuberculata, Spix, Spec. nov. Lacert. Bras. 1825, 12. Tab. XV, fig. 1.

Agama hispida, Spix, Spec. nov. Lacert. Bras. 1825, 12. Tab. XV, fig. 2.

Agama nigricollaris, Spix, Spec. nov. Lacert. Bras. 1825, 13. Tab. XVI, fig. 2.

Agama cyclura, Spix, Spec. nov. Lacert. Bras. 1825, 14. Tab. XVII, fig. 1.

Ecphymotes tuberculatus, Cuv. Règn. Anim. 2d ed. II, 1829, 47.—Guer. Iconogr. Règn. Anim.

Agama taraguira, Licht. Verz. Doubl. Berl. Mus. 1823, 101.

Tropidurus tuberculatus, Gray, Synops. Rept. in *Griff.* Anim. Kingd. IX, 1831, 42.

Oplurus torquatus, Schinz. Naturg. u. Abbild. Rept. 1833, 89. Tab. xxix, fig. 1.

Ecphymotes torquatus, Dum. & Bibr. Erpét. gén. IV, 1837, 344.

Taraguira torquata, Gray, Catal. Lizz. Brit. Mus. 1845, 220.

Descr.—The head is depressed, rather broad behind, and, when seen from above, appears subtriangular. The occipital region is somewhat depressed, whilst the snout is declivous forwards, though convex. The cephalic plates are small, unequal, polygonal, and smooth, or nearly so, there being numerous punctures over their surface; they are slightly larger upon the frontal region than on the nasal and interocular regions, and smallest upon the occipital region, with the exception of the occipital plate, properly so called, which is well developed, subpyriform, or polygonal. Two curvilinear series occupy the interocular region, proceeding from the posterior edge of the orbit, and losing themselves upon the frontal region. Upon the supraocular region, we observe two curvilinear series, an internal one, composed of very small plates, and a second series, of nine transversely elongated ones, of moderate size, and subhexagonal in shape. The area inclosed by the latter series and the supraciliaries exhibits five longitudinal series of much smaller plates, decreasing in size outwardly, smallest upon their contiguity with the supraciliaries which are six in number: the five anterior imbricated, diminishing in size posteriorly. The auricular aperture is of moderate size, vertically subelliptical, bordered anteriorly by seven spear-shaped, slender scales, simulating a serrated edge. The temporal region is covered with subrhombic, slightly keeled scales. The nasal plates are quite conspicuous, contiguous to the rostral, being situated immediately above the phrenal ridge: the nostril, which perforates their posterior portion, is directed outwardly backwards. The rostral is transversely elongated, convex above, and depressed. The phrenal ridge is composed of three plates: the anterior one being situated under the nasal, and separated from the labials by the supralabials. The phrenic region itself is protected by a few irregular plates of moderate size. The suborbital ridge is formed by four plates: the anterior one being quite small; the second very long, occupying most of the inferior rim of the orbit, whilst the two posterior are so small as to be scarcely distinguishable from the scales of

the temporal region. The eyelid is covered with crowded granules, assuming a pavement-like aspect upon the lower one, on the middle of which is observed a transparent area. There is but one series of elongated and unequal supralabials, the middle ones being wider than the upper labials. The latter, six on either side, are elongated, increasing in size posteriorly to the penultimate one; the seventh being equal to the first or second: it is followed by three or four, very small, which are lost in the midst of the scales about the angle of the mouth. The symphyseal is triangular. The lower labials, six on either side, are largest anteriorly, gradually decreasing posteriorly; they are likewise followed by three quite small plates, resembling the adjacent scales. The mental shields are conspicuous; they consitute two diverging series, from the symphyseal and the first labial, to which the anterior shield is contiguous: the former being entirely inclosed posteriorly by the first pair of these shields, which decrease rapidly in size backwards, so as to disappear amongst the scales; as many as five pairs may be distinctly counted. The scales under the head are small, elongated, and slender anteriorly, sublozenge-shaped posteriorly, and very small immediately under the throat, where a cross fold of the skin may be observed. Two oblique and conspicuous folds are seen on each side of the neck: the posterior one situated immediately in advance of the shoulder. The scales on these folds are quite small, granular, and subgranular.

The body is elongated, depressed: the back being subconvex, and the belly flat. There is no dorsal crest or ridge. The dorsal scales are small, carinated, imbricated, subrhombic, or sublozenge-shaped, disposed, along the dorsal region, upon longitudinal series, converging towards the medial line of the back; they diminish in size towards the flanks, upon the lower portion of which they constitute transverse series, becoming granular about the axillae and groins. The flanks, themselves, exhibit no longitudinal fold of the skin. The abdominal scales are smooth, disposed upon transverse and oblique series; subrhombic upon the chest and under the pelvis, subtrapezoid on the abdomen, properly so called; in size nearly equal to those of the medial region of the back, except on the chest and in advance of the shoulders, where they are somewhat larger.

The limbs are of moderate development: the anterior pair, when extended backwards alongside the body, reach the groins with the extremities of the longest fingers, while the posterior pair, similarly

extended forwards, reaches the orbit with the extremities of the longest toe only. The arms and forearms are covered with scales, similar in shape and structure to those of the dorsal region, larger above than below, and somewhat larger also on the arms than on the forearms; the carination becoming obsolete upon the carpi, while their posterior margin is either bicuspid or emarginated. On the palm of the hands, the scales are small and subtuberculous. The fingers are unequal, compressed, protected by imbricated scales, slightly keeled above, and strongly ridged beneath: a double ridge being observed at their base, and one only towards their extremity. The nails are compressed, acute, and curved. The scales on the upper surface of the thighs and legs are likewise similar in shape and structure to the dorsal ones, and somewhat larger on the legs than on the thighs; on the posterior aspect of the latter, they are quite small, almost granular; beneath, they are smooth, rather rounded, entire under the thighs, subrhombic and bicuspid under the legs, where they are also somewhat larger than under the thighs. The femoral pores are wanting. On the tarsi, the scales are conspicuously carinated still, while on the sole of the feet, they assume a subtubercular aspect, owing to the keel existing at their extremity only: besides, being quite reduced in size. The toes are unequal, compressed, surrounded with imbricated and keeled scales, strongly unicarinated beneath. The nails having the same shape as at the fingers.

The tail is elongated, quite stout, and depressed at the base, subconical, slightly compressed, and tapering posteriorly. It is surrounded with rather large scales, subrhombic above, sublanceolated beneath, all strongly keeled, the keel projecting beyond their edge, except upon the postanal region, where they are smooth and tricuspid; at the base and depressed portion, they constitute longitudinal series, converging upwards, whilst on the compressed portion, they are subverticillated: the upper medial series being provided with a more conspicuous keel, giving that region of the tail a ridged or subcrested appearance.

The ground color above is either brownish-olive or greenish-brown, spotted with black or light olive. A pale streak, more or less apparent, may be observed on either side of the back; and, on the sides of the neck, immediately in advance of the shoulder, there exists a black, white-lined, vertical band. The chin is variegated with irregular dark lines or spots, upon a rather light yellowish or whitish ground.

The throat itself is generally blackish. The abdomen, the limbs, and tail beneath, are yellowish, unicolor, except in the male sex, in which the under surface of the thigh exhibits an elongated, black area, the result of crowded, small spots, one of which may be seen upon each scale.

Loc.—Rio de Janeiro, Brazil.

Genus SACCODEIRA, Girard.

Char. gen.—*Scutis cephalicis minoribus, multicarinatis. Naribus lateralibus, super porcam supraciliarem sitis. Squamis temporalibus carinatis et imbricatis. Aurium margine anteriore denticulato. Collo a lateribus perulis munito, et squamis parvulis coöperto; perulis intra granulatis. Plicatura scapulari vertico-obliqua. Squamis dorsualibus modicis, conspicue carinatis, acuminatis; serie dorsuali mediana, cristae humili similitudinem praebente: abdominalibus laevibus et integris. Poris femoralibus et praeanalibus nullis. Cauda ampla, ad basim compressa, postice minuente. Digitis palmarum plantarumque gracilibus, inaequalibus.*

Gen. Char.—Cephalic plates rather small, multicarinated. Nostrils lateral, placed immediately above the supraciliary crest. Temporal scales carinated and imbricated. Auricular aperture denticulated in front. Sides of the neck pouched, covered with small scales and granules within the pouches. A vertico-oblique fold in advance of the shoulder. Dorsal scales moderate, conspicuously carinated, acuminated; central dorsal series simulating a low crest. Abdominal scales smooth and entire. Femoral and preanal pores none. Tail broad at the base, compressed, and tapering posteriorly. Fingers and toes slender, unequal.

Syn.—*Saccodeira*, Grd. in Proc. Acad. Nat. Sci. Philad. November, 1857.

Observ.—The relationships of this genus are with *Microlophus*, *Holotropis*, or *Leiocephalus*, and *Proctotretus*, and its congeners. It has neither femoral nor preanal pores, and the middle dorsal series of scales exhibits an inconspicuous crest or ridge, formed by somewhat more-developed keels than those of the adjoining series. By its carinated cephalic plates and dorsal crest it approximates *Proctotretus* proper, binding the Steirolepids to the Heterotropids.

Saccodeira ornatissima, Grd.

(Plate XXVIII, figs. 1–8.)

Char. spec.—*Scutis cephalicis minutissimis, fere aequalibus; supralabialibus, quam super labiales gracilioribus et minoribus, in unicam seriem dispositis. Squamis temporalibus parvis. Apertura auditoria magna. Squamis subaequalibus; dorsualibus et lateralibus sublanceolatis et carinatis; abdominalibus postice rotundatis. Tota femorum facie posteriori minutissime granulosa. Supra fusco-cinerea, cum dupla dorsuali serie nigro-fuscarum macularum subtriangularum. Cruribus maculatis. Facie capitis superiori nigrescente; ejus lateribus et facie inferiori albescentibus, et parvis atris maculis notatis. Abdomine flavescente, unicolori.*

Spec. Char.—Cephalic plates very small, and nearly equal-sized. Supralabials in one series, slenderer and smaller than the upper labials. Temporal scales quite small. Auricular aperture large. Scales subequal; dorsal and lateral ones sublanceolated and carinated; abdominal ones posteriorly rounded. Posterior aspect of thighs minutely and wholly granular. Greyish-brown above, with a double series of dark brown, subtriangular spots along the dorsal region. Limbs maculated. Upper surface of head blackish; sides and under surface whitish, with small jet-black spots. Abdomen dull yellow, unicolor.

Syn.—*Saccodeira ornatissima*, Grd. in Proc. Acad. Nat. Sci. Philad. November, 1857.

Descr.—The head is elongated, of moderate development, depressed, and, when seen from above, ovoid in its outline. The cephalic plates are unequal, polygonal, subtuberculous, or moderately multicarinated. The largest are observed on the occipital region, though the occipital plate, properly so called, is small, acutely subtriangular, with the summit of the triangle directed backwards. The fronto-nasal region exhibits two pairs of plates, nearly equal in size to the ones just alluded to. The interocular plates, of which there are two series, are slightly smaller than the preceding. The supraocular plates are smaller yet; they constitute two curvilinear, and two longitudinal and parallel series,

the latter being composed of very small plates, situated between the supraciliary ridge and the curvilinear series, the inner of which is composed of the largest plates of that region. A series of four or five flattened scales may be observed above the posterior portion of the supraciliary ridge, which extends conspicuously as far as the nostril. The supraciliary ridge itself is composed of five thin and elongated plates, and two or three short ones above the posterior rim of the orbit. Its continuation along the face takes place through the means of two very convex plates. The nostril is situated just above this ridge, perforating a small oblong plate, separated from the rostral by a narrow prenasal and the first supralabials. The suborbital plate is quite developed, narrowest upon its middle, and dilated at both extremities. An anteorbital of moderate development closes the suborbital chain by coming into contact with the supraciliary ridge. There are but two loral plates, the anterior being the smallest, and contiguous to the nasal. Four narrow and elongated plates constitute a series of supralabials, extending from the nasal to a small distance beyond the middle of the eye. The rostral is low, convex above, and transversely elongated. There are six upper labial plates on either side, elongated and narrow, somewhat broader, however, than the supralabials, and increasing in length from the anterior one to the fourth, then abruptly decreasing. The symphyseal is quite conspicuous and subelliptical; the lower labials, five on either side, are larger also than the upper: the second, third, and fourth are subequal, the first and fifth being somewhat smaller. Three pairs of rather large mental shields may be seen diverging from the symphyseal; the remaining pairs are scarcely distinguishable from the scales at the angle of the mouth, one series of which extending forwards, between the lower labials and the mental shields, a little beyond the posterior edge of the first labial and first mental shield, though not reaching the symphyseal. The scales under the head are smooth, subequal, subrhombic, increasing in size towards the chest, where they are largest. The temporal region is protected by small, scale-like, keeled plates. The auricular aperture is proportionally large, provided, upon its infero-anterior edge, with two projecting scales. The tympanum is somewhat sunk, though still visible.

The neck is but slightly contracted, and exhibits sideways a subhorizontal and conspicuous fold, under which is a small pouch; another, much smaller fold, may be observed immediately in advance of the shoulder. The scales are small, elongated, or sublanceolated,

and keeled, assuming a granular aspect just behind the auricular aperture, and upon a very small area too.

The body is rounded, somewhat depressed; the back slightly convex, and the belly flat. It is covered above with subequal, rhombic, conspicuously keeled scales, disposed upon longitudinal series, somewhat oblique upwards along the sides, where they are likewise smaller. The abdominal scales are subequal, somewhat smaller also than on the dorsal region, subrhomboid or sublozengiform, smooth, some of them emarginated or bicuspid posteriorly; diminishing in size as they approximate the sides, showing, at the same time, a slight keel; about the axillae and groins, they are either very small or else granular.

The limbs are slender, and of moderate development: the anterior pair, when bent backwards alongside the body, does not extend to the groins; and, when the posterior pair is brought forwards in a similar manner, the tip of the longest toe reaches the auricular aperture; their upper surface is covered with rhombic scales, carinated as far as the tip of the toes, as usual, largest upon the arms and legs than on the forearms and thighs, and smallest on the carpi and tarsi, and lower surface of the fore pair; under the thighs and legs, they resemble the abdominal ones in shape and structure. The fingers and toes are unequal, compressed, and bicarinated beneath. The nails are slender, compressed, curved, and acute.

The tail is once and a half as long as the head and body combined; it is slender and tapering, thick, and depressed at the base; then slightly compressed and conical posteriorly. The scales of its upper surface are equal to those of the back, keeled, and disposed upon longitudinal series; beneath, they are elongated, sublanceolated, equally keeled, and disposed upon longitudinal series. On the posterior third, the scales are verticillated, and those of the upper surface are likewise elongated and lanceolated.

The ground color is greyish-brown above, and, during life, rather of an olivaceous hue, along the upper portion of the flanks. A double series of blackish-brown, light-margined, subtriangular spots may be observed along the back, with their bases parallel to the dorsal line: the spots of either series alternating on the anterior portion of the body, whilst they are opposite each other posteriorly, where they assume the aspect of a continuous transverse band, broadest in the middle, and tapering towards each side. These spots or bands may be

traced along the upper surface of the tail to its tip. The limbs are transversely barred with blackish-brown: the bands being likewise margined with yellowish-olive, though, on the anterior pair, the latter hue invades all the intervening spaces between the dark bands, leaving no room for the ground color to appear. The sides of the body are black-speckled, as also the hands and feet. The upper surface of the head is almost of a uniform blackish-brown: the supraciliary ridge and the rostral plate being light straw-color, of which a few specks may occasionally be seen on the cephalic and occipital regions. The sides of the head and neck are variegated with jet-black and yellowish-white. The chin, throat, and a portion of the chest are whitish, over which are interspersed small jet-black spots, of various shapes. The abdomen and under surface of the tail are dull yellow, unicolor.

In the female sex, the ground is paler, and a jet-black longitudinal band may be observed from the temporal region, across the ear, to the axilla: the abdomen being clouded with greyish meanders.

Loc.—The male specimen figured, and which was sketched from life, was obtained in the Lower Cordilleras, just below Obrajillo. A female specimen, of about the same size, was caught in the neighborhood of Yanga, Republic of Peru.

Plate XXVIII, fig. 1, represents *Saccodeira ornatissima*, size of life.
Fig. 2, is an upper view of the head;
Fig. 3, its profile; and,
Fig. 4, an under view of the same region.
Fig. 5, the left hand, from above;
Fig. 6, the same, from beneath.
Fig. 7, exhibits a group of dorsal scales;
Fig. 8, a group of abdominal scales.
Figs. 2–8, are somewhat magnified views.

Genus PROCTOTRETUS, Dum. & Bibr.

Gen. Char.—Maxillary teeth simple and subconical. Palate toothed. An external auricular aperture. Dorsal scales keeled. Neck and back, properly speaking, not crested. Abdominal scales generally smooth. Sides of the neck variously folded, with a few exceptions.

No gular fold. No femoral pores; preanal pores in the male sex. Tail tapering, simple. Fingers and toes five, simple.

Syn.—*Proctotretus*, Dum. & Bibr. Erpét. gén. IV, 1837, 266.—Bell, Zool. Voy. Beagle, V, 1843, 1.—Fitz. Syst. Rept. 1843, 74.—Gray, Catal. Lizz. Brit. Mus. 1845, 216.—Guich. in *Gay*, Hist. de Chile, Zool. II, 1848, 23.—Grd. in *Gilliss* U. S. N. Astr. Exped. S. Hemisph. II, 1855, 217.

Observ.—This group is characterized by the presence of preanal pores in the male sex, and in the total absence of femoral pores. The body is rounded off, somewhat depressed, covered with imbricated scales, varying considerably in size and shape: the dorsal ones, and often the lateral also, are carinated: the keels being more or less developed, either projecting beyond the posterior edge of the scale, which is then acuminated or lanceolated, else not extending quite to the margin of the same, which, in that case, is rounded or subrhomboid. The lateral scales being either equal to the dorsal ones, subequal, or smaller. The abdominal scales are larger than the lateral ones, generally smooth, rounded, and entire posteriorly, sometimes acuminated, subciliated, or emarginated. The dorsal region is generally even or without crest: in a few instances, pectinated ridges may be observed.

The head, which is more or less depressed, is subquadrangulo-pyramidal, narrow, rounded, or subtruncated anteriorly. The cephalic plates are of small, or of moderate size, polygonal or lanceolated, either imbricated and carinated, else unimbricated and smooth. There are teeth, more or less conspicuous, on the palatine or pterygoid bones. The temporal scales are smooth or carinated, imbricated or not. The auricular aperture is either denticulated, tubercular, or granular in front, else simple: the tympanum being situated somewhat below the surface of its orifice. The sides of the neck are either even, without fold of any kind, or an indistinct longitudinal one is observed; sometimes, a vertico-oblique, scapular fold is observed with an indistinct longitudinal one; at others, it is multifolded or rumpled. Scales similar in shape and structure to those of the back or sides, may extend over its surface or folds, or the latter may be entirely granular. There is no gular fold or collar.

The body is supported by four limbs, terminated by five fingers and five toes, simple and clawed; their upper surface is covered with scales similar in shape and structure to those protecting the body. The inferior aspect of the arms and posterior aspect of the thighs, are either

covered with minute scales or granules: te thighs being either wholly granular or else exhibiting a patch of small scales near the base of the tail.

The tail itself is either long or moderate, depressed at the base, conical posteriorly, and tapering into a point, protected by carinated and subverticillated scales, of various forms, though even aspect.

The species which come under the above heading having become quite numerous, writers have felt the necessity of subdividing the genus into minor groups or subgenera, according to secondary traits of organization, or rather zoölogical structure.

Being cast, as it were, in the same mould, their structural characters are multifold, and considerably interwoven, as is generally the case, at large. The association of these characters will not allow an absolute line of demarcation to be drawn between all the minor groups. Sometimes one series of characters and sometimes another series is to guide the zoölogist in the divisions he is about to establish.

In the following systematic arrangement, we have endeavored to remain faithful to the natural method, and, we hope, not without success. Certain species on the confine of their division may sometimes appear as though entitled to enter one group as readily as another, but we are satisfied that when the species shall have been better investigated in that respect, the characters which we assign to each division will only gain in strength and permanency. New species may be added, requiring the establishment of new divisions, without invalidating those which are now proposed.

Whether the subgenus *Sauridis*, of Tschudi,* is really distinct from those hereinafter treated of, we are not prepared to tell. The absence of palatine teeth would, in itself, be a valuable character, should it be proved that they exist under all circumstances elsewhere in the same group. The rest of its diagnosis alludes to nothing peculiarly distinct from characters assigned to other genera. By the folds of its neck, it reminds us of either *Ptychodeira* or *Rhytidodeira*, and by its cephalic plates, mayhap, somewhat *Eulaemus*. As to *S. modestus*, the only species so far referred to it, being described simply in its coloration, it would be idle to attempt tracing out its affinities with the numerous species of the group we are now to pass in review. Tschudi seems to hold it closely related to *Tropidurus oxycephalus*, of Wiegmann: hence, the affinities of *Sauridis* would be with *Rhytidodeira*.

* Faun. Peruan. Herp. 1845, 34.

Subgenus PROCTOTRETUS (Dum. & Bibr.), Grd.

Gen. Char.—Cephalic plates small, subequal, imbricated, and carinated; one or two series of supralabials. Nostrils lateral, in a line with the supraciliary crest. Temporal scales moderate, carinated, not acuminated. Auricular aperture small or moderate, denticulated in front. Sides of neck with a slight longitudinal fold, and a vertico-oblique one in advance of the shoulder, covered with scales similar to those of the back. Dorsal and lateral scales large, subequal, subrhomboid, or sublanceolated, conspicuously carinated, and acuminated. Abdominal scales sublanceolated, and bifid posteriorly. Posterior aspect of thighs minutely scaly. Colors: longitudinally light-streaked, with intervening series of dark spots.

Observ.—The small, imbricated, and keeled cephalic plates, will easily distinguish this group from its natural allies. Even the abdominal scales seem to be more deeply emarginated than in the following subgeneric groups.

According to Fitzinger, *Liolaemus marmoratus*, of Gravenhorst (Nov. Act. Acad. nat. cur. XVIII, ii, 1838, 728, Pl. liv, fig. 11), would belong to this genus.

1. Proctotretus splendidus, Grd.

(Plate XVII, figs. 1–7.)

Char. spec.—*Scutis labialibus exiguis, elongatis, et paulo majoribus quam supralabiales, qui in seriem duplicem disponuntur. Squamis temporalibus imbricatis. Apertura auditoria parva. Unica serie scutorum infralabialium, exiguiorum quam labiales inferiores. Scutorum mentalium tribus paribus. Cristis pectinatis tribus, una secundum dorsalem regionem medianam et una in utroque tergi latere. Supra smaragdino-viridi, cum quinque seriebus macularum subovatarum, fusco-castanearum, et nigro marginatarum. Cristis pectinatis lateralibus aureis. Facie capitis superiori transverse aureo lineata. Lateribus corporis et cruribus fulvo-flavis, fusco variegatis. Infra albescente.*

SPEC. CHAR.—Labial plates narrow and long, somewhat larger than the supralabials, which are disposed upon two series. Temporal scales imbricated. Auricular aperture small. One series of infralabials, narrower than the lower labials. Three pairs of mental shields. Three pectinated crests, one along the dorsal line, and one on each side of the back. Emerald-green above, with five series of subovate, chestnut-brown, black-margined spots. The lateral pectinated crest of a bright yellow. Head transversely streaked with bright yellow, also. Sides and limbs variegated with brown, upon a fawn-yellow ground. Beneath whitish.

SYN.—*Proctotretus pectinatus*, BELL, Zool. of Beagle, V, Rept. 1843, 18. Pl. IX, fig. 2.

Ptygoderus pectinatus, GRAY, Catal. Lizz. Brit. Mus. 1845, 216.

Proctotretus splendidus, GRD. in Proc. Acad. Nat. Sci. Philad. November, 1857.

DESCR.—The general appearance of this species is rather short and thickish. The body is depressed, wider than deep. The head, which is separated from the body by a somewhat contracted neck, is depressed also, though convex upon its upper surface, and very much declivous from the orbital region forwards, giving to the snout a wedge-shaped appearance: the jaws being even. The cleft of the mouth, in advance of the orbit, is subconcave, and its angle nearly horizontal. The auricular aperture is small, subcircular, or vertically subovoid, overlapped anteriorly and superiorly by a conspicuous, subconical scale. The limbs are moderate in their development: the anterior being more slender than the posterior, and, when brought backwards in a line with the body, the tips of the fingers are far from reaching the groins. On the other hand, in bringing forwards the posterior limbs, the tip of the longest toe is made to reach the axilla. The tail is very thick, and depressed upon its base, but very soon diminishes posteriorly, where it tapers into a conical point, being altogether longer than the body and head combined.

The upper surface of the head is covered with small, subrhomboid, imbricated, and carinated plates: the largest may be observed upon the occipital region, then, along the line of the vertex, towards the frontal region; they being smallest above the eyes. The supraciliary ridge is conspicuous, composed of six or seven elongated and thin plates, except the anterior one, which is stout and short. The nostrils are situated upon the prolongation of that ridge, mayhap, slightly inwardly,

but still, apparently belonging to the sides of the head; their opening is very conspicuous, perforating the posterior edge of a single, subelliptic plate, separated from the rostral by two much smaller plates. The rostral itself is low, and broad upon its base, having the shape of a very much depressed cone. The upper labials are four in number, elongated, and narrow. There are two rows of supralabials: the lower one composed of three plates only, elongated, and narrower than the labials themselves; the upper row is composed of six elongated, quite conspicuous plates. The loral region is occupied by a half dozen of small, subquadrangular plates. There are three suborbitals: the middle one very large and elongated. The temporal region is covered with rhomboid and carinated scales, similar to those which may be seen on the occiput. The surface of the eyelid is granular, whilst its edge is provided with a double row of small, quadrangular plates. We observe six elongated, nearly equal, lower labials, not quite so narrow as the upper ones. The symphyseal is well developed, laterally concave at the commissure of the first labial, and rounded posteriorly. Three pairs of mental shields may be seen, diverging from it. The remaining portion of the throat is covered with quite large, sublanceolated, and smooth scales, notched upon their posterior margin.

The scales on the upper surface of the body are large, subrhomboid, conspicuously carinated, and posteriorly acuminated. A series on either side may be observed extending from the posterior suborbital, along the sides of the neck to the depressed portion of the tail, quite raised above the other, constituting a lateral crest: these inclose a dorsal area of nine series of scales. The middle dorsal series exhibits a more prominent keel than the two adjoining series; the keels on the third series again are more conspicuous than on the fourth series; thus, we have, as it were, a tendency to five longitudinal crests, more or less prominent. The sides of the neck are covered with well-developed and carinated scales. A vertical fold of the skin may be observed a little way in advance of the shoulder, directed somewhat obliquely backwards. Between the auricular aperture and the fold just mentioned, may be seen a series of somewhat raised scales, simulating a horizontal fold. About the axillae, the scales are very small, but carinated still. On the upper part of the flank, they are like those of the back, similarly carinated, obliquely disposed, and more acute at their posterior extremity. About the groins, they are larger than about the axillae, and likewise keeled. On the broad and depressed portion of

the tail, the scales resemble those of the back, whilst they are shorter on the conical and tapering portion, and keeled to the very tip, towards which they become quite slender. The abdominal scales are well developed and smooth, sublanceolated, notched or bifid posteriorly; they are smaller and irregular upon the preanal region, but the preanal margin is provided with a row of conspicuously larger ones; their size is quite reduced upon the postanal region, but soon increase in size along the inferior surface of the tail, exhibiting a bifid or notched posterior extremity, as on the abdomen. The upper surface of the fore limbs is covered with scales, smaller than those of the back, though keeled, and more acute posteriorly; they become quite small, but still carinated, upon the posterior and inferior aspects of the forearm and palm of the hands; they are larger and rather smooth upon the anterior aspect of the arm and carpus, and carinated upon the posterior aspect of the same organs. The fingers are surrounded with four series of carinated scales, one above, two sideways, and one beneath; the inner or first finger is the smallest; the fifth or outer one is the next in length; then, the second, fourth, and third, which is the longest. The nails are well developed, compressed upon their base, conical, curved, and acute at the apex. The upper surface of the hind limbs is likewise covered with carinated scales, smaller than those of the back; they are smaller on the tarsus than on the leg proper, and smaller on the leg than on the thigh. On the inferior surface of the thigh and leg, the scales are well developed, sublanceolated, and smooth, whilst they are small and carinated on the soles of the feet; they are very small, subgranular on the posterior aspect of the thighs. The squamation of the toes is similar to that of the fingers, there being an upper series, a lateral, and an inferior series: the latter provided with a double keel. The first or inner toe is the longest; the second the next in length; then, the fifth or outermost follows the third and fourth, which is the longest of all.

The ground color is of a dusky yellow: the lateral series of raised scales being bright yellow. The dorsal space inclosed by these streaks is marked with three series of chestnut-brown, black-margined spots. The spots of the middle series are larger than those of the adjoining series; they all are elongated and subovoid. The upper surface of the head exhibits several transverse spots or bars of bright yellow. Two other series of spots may likewise be observed along the flanks, immediately beneath the yellow streak; they are smaller than on the back,

and occasionally blended together. The space between these brown spots is of an emerald-green in adult individuals: a tint which is liable to turn into blue by immersion in alcohol. The upper surface of the limbs is irregularly spotted with brown. The sides of the neck is mottled with rusty yellow and blackish-brown. Beneath, the color is of a uniform white or dull yellow.

Loc.—Specimens of this species were collected on the banks of the Rio Negro, in Patagonia, being quite abundant among the sandhills. A colored sketch of one of them was made, at the time, by Mr. Drayton.

Plate XIX, fig. 1, represents *Proctotretus splendidus*, in profile, and size of life.

Fig. 2, exhibits the inferior surface of the same animal.

Fig. 3, the upper surface of the head;

Fig. 4, a front view of the same.

Fig. 5, the left hand, from above.

Fig. 6, a group of dorsal scales;

Fig. 7, a group of abdominal scales.

Figs. 3–7, are somewhat magnified.

2. Proctotretus pectinatus, Dum. & Bibr.

Spec. Char.—Labial plates exceedingly narrow and elongated; one series of supralabials. Auricular aperture moderate, with two or three erect scales in front. A pectinated crest on each side of the body, formed by somewhat narrower and more erect scales. Greyish-fawn above, with three series of large, ovate, blackish, white-margined spots. The pectinated crest is white. Three yellowish or whitish streaks across the head. Beneath white.

Syn.—*Proctotretus pectinatus*, Dum. & Bibr. Erpét. gén. IV, 1837, 292.—Guich. in *Gay*, Hist. de Chile, Zool. II, 1848, 44.

Liolaemus (Proctotretus) pectinatus, Fitz. Syst. Rept. I, 1843, 74.

Observ.—This species, though closely allied to the preceding one, will appear sufficiently distinct from it, since there is but one pecti-

nated crest on each side, and three series of black spots along the upper region of the body. The presence of but one series of supralabials is another trait none the less characteristic.

Loc.—Chile.

Subgenus LIOLAEMUS, Wiegm.

Gen. Char.—Cephalic plates well developed, smooth; one series of supralabials. Nostrils in a line with the supraciliary crest. Temporal scales moderate, carinated, not acuminated. Auricular aperture large, denticulated in front. Sides of neck not folded with scales like those of the back; no vertico-oblique fold nor scapular pouch. Dorsal and lateral scales large, subrhomboid, conspicuously carinated, and acuminated; abdominal scales large, smooth, posteriorly rounded and entire. Posterior aspect of thighs granular. Colors: transverse dark fasciae, upon a lighter ground, or else unicolor.

Syn.—*Liolaemus*, Wiegm. in Nov. Act. nat. cur. XVII, i, 1835, 221 & 227.—Gravenh. in Nov. Act. nat. cur. XVIII, ii, 1838, 717.—Fitz. Syst. Rept. 1843, 74 — Gray, Catal. Lizz. Brit. Mus. 1845, 213.—Tsch. Faun. Peruan. Herp. 1845, 33.

Observ.—We are not prepared to tell whether *Liolaemus bellii*, Gray (Catal. Lizz. Brit. Mus. 1845, 212), *L. unicolor*, Gravenh. (Nov. Act. nat. cur. XVIII, ii, 1838, 728), both from Chile, belong to this section or to *Liodeira;* they not being sufficiently described to permit classification in regard to the genera or subgenera, as here circumscribed. *Liolaemus elegans*, Tsch. (Faun. Peruan. Herp. 1845, 33), from the coast of Peru, falls into the same category.

Liolaemus nitidus, Gravenh.

(Plate XXVIII, figs. 17–24.)

Spec. Char.—Scales subequal. Nasal plate contiguous to the rostral. Supralabials moderate, somewhat narrower than the labials. Four pairs of mental shields. Tail stoutish, longer than the body and

head together, depressed at the base, subconical, and tapering posteriorly. Olive-brown above, with narrow, transverse, black bands; head varied with black. Beneath yellowish; chin and throat irregularly lineated with black; belly and tail unicolor.

Syn.—*Tropidurus nitidus*, Wiegm. in Nov. Act. nat. cur. XVII, i, 1835, 234. Tab. xvii, fig. 2 (young).

Liolaemus nitidus, Gravenh. in Nov. Act. nat. cur. XVIII, ii, 1838, 727. Pl. liv, figs. 8–10.

Liolaemus lineatus, Gravenh. in Nov. Act. nat. cur. XVIII, ii, 1838, 723. Pl. liv, figs. 1–7.—? Gray, Catal. Lizz. Brit. Mus. 1845, 213.

Descr.—The head is quite depressed, gradually declivous from the occiput to the snout, otherwise, subpyramidal, rather obtuse anteriorly. The neck is almost continuous with the posterior part of the head, being but slightly contracted upon the gular region; and, as to the body, it is subcylindrical, rounded above, flattened beneath, diminishing somewhat posteriorly, being rather depressed upon the pelvic region, hence passing gradually to the subconical and tapering tail, which is much longer than the other regions of the animal taken together. The limbs are moderate in length: the anterior ones are slender, not extending to the groins, when stretched in that direction; the posterior ones are stouter, and, when extended forwards, the tip of the longest toe may approximate the auricular aperture.

The cephalic plates are well developed, and arranged with great regularity and symmetrical beauty upon the specimen now before us. We first observe an anterior pair of transversely elongated and exiguous internasals, contiguous upon the middle line of the snout, and laterally each to the nasal plate; then, a posterior pair, subpentagonal, longitudinally, and somewhat obliquely situated upon the middle of the internasal region, contiguous anteriorly to the pair just alluded to. Five fronto-nasals come next, placed upon a crescent-shaped figure: a middle one, hexagonal and elongated, is situated immediately behind the commissure of the posterior pair of internasals, and between which its anterior angle somewhat engages, whilst its posterior angle is slightly engaged between the commissure of the prefrontals; the adjoining two, subpentagonal in shape, are placed one on each side of the middle one, with their longest diameter directed obliquely outwards; the remaining two are elongated, exiguous, posteriorly acute, situated between the outer angle of the prefron-

tals and the supraciliary ridge. A pair of elliptically polygonal prefrontal plates, the largest amongst the cephalic ones, may be seen immediately behind the fronto-nasals, inclosing, upon the posterior half of their commissure, a small and odd cordiform plate. A postfrontal pair fills up the area between the prefrontals, the supraoculars, and the vertex plate. The latter is elongated, subhexagonal, and rather broader anteriorly than posteriorly. Four pairs of subequal and quadrangular parietals form, on each side of the occipitals, a curved series, concave towards the supraocular region: the plates of the anterior pair are contiguous upon their inner edge; the others are inclosed, on one side by the occipitals, and on the other, by the supraoculars. The middle occipital is rather small, subpentagonal, posteriorly acuminated, and engaging between the rather more developed contiguous postoccipitals. Two exiguous pairs of latero-occipitals, situated side by side, exteriorly to the postorbitals, close that long series of cephalic plates.

We have yet to allude to the supraoculars: three, somewhat more developed than the rest, though unequal, occupy the posterior and middle space of that region; while a semicircular series, of rather small and irregular ones, separates them from the parietals, the vertex, and the frontal plates, and a longitudinal series of similarly irregular and small plates isolates them from the supraciliary series. The anterior remaining portion of the supraocular region, inclosed by the two series just alluded to, is covered with small, irregular plates. The supraciliary series is composed of five or six, unequal, thin, tiled laminae, occupying the region immediately above the orbits. Its continuation forwards along the line of the canthus rostralis, exhibits but two more plates, the foremost of which being the smallest. In advance of that ridge is situated the nasal plate, perforated by the nostril, contiguous anteriorly to the rostral, inferiorly to the anterior supralabial, superiorly to an exiguous supranasal, and posteriorly to three unequal postnasals: the middle one being very small; the uppermost exiguous and curved; the lowermost subtriangular and moderate. A second and small upper postnasal may be observed, between the lateral naso-frontals, the uppermost postnasal, the naso-frontal, and the anterior of the supraciliary ridge. The loral region is occupied by three plates: a small one may be seen under the anterior extremity of the supraciliary ridge, and immediately behind the inferior postnasal; the other two are larger, angular, subequal, placed one in advance of the other,

under the sub- and anteorbitals. The inferior rim of the orbit is almost exclusively formed by an elongated, curved, and ridged plate, with a small one anteriorly, the anteorbital, and a thin diminutive one posteriorly, the postorbital. The rest of the posterior rim is formed by very small plates, passing gradually to the moderate, keeled, posteriorly obtuse scales which cover the temporal region.

The rostral plate is quite narrow, and transversely elongated. It is followed, on either side, by five upper, narrow, and elongated labials, increasing in size to the fourth, which is the largest: the fifth being the smallest, subtriangular, and somewhat overlapped by the fourth. There is but one series of supralabials, composed of six narrow and elongated plates, somewhat smaller than the labials, increasing in size to the fifth, which is the largest: the sixth being nearly equal to the first, though shorter and broader. The symphyseal is hemidiscoid, and larger than the rostral. The lower labials, five on either side, are elongated and narrow, largest anteriorly (larger also than the upper labials), and gradually diminishing to the fifth, which is exiguous. Four pairs of mental shields may be observed: the shields of the anterior pair, contiguous upon their inner edge, and adjoining the symphyseal and first lower labial, whilst the remaining pairs are diverging posteriorly. An irregular double series of elongated infralabial scales exists between the mental shields and the lower labials. The scales on the chin and throat are well developed, posteriorly rounded, subequal, and nearly as large as the abdominal ones.

The auricular aperture is large, vertically subovate, provided anteriorly with projecting scales, giving to that edge a denticulated appearance. The scales on the sides of the neck are well developed, subacuminated and keeled, and nearly equal to those of the upper surface of the same region. The scales adjoining the occipital plates are somewhat smaller than the following ones. Those of the upper region of the body are subequal, conspicuously keeled, and acuminated, constituting longitudinal series: the lateral ones converging upwards towards the pelvic region and base of the tail, where they are still more acute posteriorly. Upon the inferior region, they are smooth, subequal, rounded posteriorly, being likewise smooth and subequal under the hind limbs, keeled and subacuminated above, and nearly as large as on the back. The posterior aspect of the thigh is wholly granular, somewhat more coarsely inferiorly. The axilla is minutely granular, whilst small and obtuse scales exist under the arm, some-

what larger, and slightly keeled under the forearm. The scales on the upper surface of the fore limbs being conspicuously keeled, somewhat acuminated, though smaller than on the back. The palms of the hands and soles of the feet are densely covered with small, acute, and keeled scales, giving these surfaces quite a rough appearance. The fingers and toes are scaly above and sideways, and transversely plated beneath, the fingers being nearly smooth above, whilst the toes are carinated: the inferior aspect of both fingers and toes being multicarinated. The nails are compressed, curved, and acute. The scales on the inferior surface of the tail are somewhat smaller than on its upper surface, more lanceolated, and less conspicuously keeled.

The color of the adult is olivaceous-brown above, with narrow, transverse, blackish bands across the back, covering but one scale, margined with a lighter hue. The head is variegated with black; the limbs and tail are unicolor. Beneath, the tint is yellowish; the chin and throat exhibiting interrupted, longitudinal, black lines.

The young, as colored from life in May, 1839, exhibits a greyish-brown hue along the dorsal region, with four longitudinal series of small, subtriangular, brownish-black spots, with their bases directed forwards, and contiguous sideways, so as to constitute, as it were, transverse bands or fasciae; three series of white, intervening spots are also observed behind and contiguous to the dark ones. A lateral series of brownish, much less distinct spots, extends along the upper portion of the flanks, which otherwise exhibit a light greyish hue, variegated with brown and pink. The base of the tail is transversely barred with blackish-brown, whilst it is unicolor posteriorly. The upper surface of the limbs is greyish, transversely barred or maculated with darker blotches. The upper surface of the head is reddish-brown; its lower surface is whitish, with meandriform lines of black. The belly is yellowish-white, obscurely maculated: the spots fading away over the chest; the belly, limbs, and tail being unicolor. The posterior aspect of the thighs is variegated with black and whitish spots.

Loc.—Very common in the environs of Valparaiso, Chile.

Plate XXVIII, fig. 17, represents *Liolaemus nitidus*, size of life; It is the type of Gravenhorst's *L. lineatus*.

Fig. 18, is an upper view of the head;
Fig. 19, a profile; and,
Fig. 20, a view from beneath of the same region.
Fig. 21, the left hand, from above;
Fig. 22, the same, from beneath.
Fig. 23, exhibits a group of dorsal scales;
Fig. 24, a group of abdominal scales.
Fig. 25, represents the young of the same species, originally described by Wiegmann as *Tropidurus nitidus*.

Subgenus LIODEIRA (Dum. & Bibr.), Fitz.

Gen. Char.—Cephalic plates moderate, not imbricated, smooth; one series of supralabials. Nostrils lateral. Temporal scales carinated, imbricated. Auricular aperture denticulated in front. Sides of neck not folded; a vertico-oblique fold in advance of the shoulder; covered with scales similar to those of the back. Dorsal and lateral scales large, rhomboid, conspicuously carinated, and acuminated. Abdominal scales posteriorly rounded, entire, or bifid. Posterior aspect of thighs minutely scaly or granular. Colors: longitudinal or transverse series of dark spots, upon a lighter ground.

Syn.—*Léiodères*, Dum. & Bibr. Erpét. gén. IV, 1837, 269.—Dum. & A. Dum. Catal. Rept. Mus. d'hist. nat. i, 1851, 71.
Liodeira, Fitz. Syst. Rept. I, 1843, 17 & 74.
Leiodera, Gray, Catal. Lizz. Brit. Mus. 1845, 210.

Observ.—Differs from *Liolaemus*, which it most resembles, by a vertico-oblique fold in advance of the shoulder, simulating a diminutive pouch.

In the absence of specimens and accurate information regarding *Leiodera gravenhorsti*, Gray (Catal. Lizz. Brit. Mus. 1845, 211), we are unable to furnish a diagnosis of the specific characters of that species, which is a native of Chile, and considered by Thos. Bell as a mere variety of *L. chilensis*.

Liolaemus inconspicuus, Gray (Brit. Mus. 1836; &, Catal. Lizz. Brit. Mus. 1845, 213), appears to us more closely related to the species of *Liodeira* than those of *Liolaemus*, though the scanty information we possess will not allow us deciding that question.

Liodeira chilensis (Dum. & Bibr.), Grd.

Spec. Char.—Head rather short; snout obtuse and rounded. Supralabial plates very narrow and elongated. Two series of infralabials. Three pairs of mental shields. Temporal scales moderate, equal, keeled. Scales on the sides of the neck thin and rhomboid; lateral and abdominal scales smaller than the dorsal ones, and posteriorly entire; on the flanks keeled and acuminated; on the belly smooth. Posterior aspect of thighs uniformly and minutely scaly or subgranular. Color of a uniform bronze hue, or transversely undulated with brown, or variegated with yellow; else, fawn-yellow, with two longitudinal brownish bands: a similar streak over the temples, and a forked one upon the nape.

Syn.—*Calotes chilensis*, Less. Voy. Coq. Zool. II, i, 1830, 36. Pl. i, fig. 2.
Tropidurus chilensis, Wiegm. in Nov. Act. nat. cur. XVII, i, 1835, 233 & 268.
Tropidurus olivaceus, Wiegm. in Nov. Act. nat. cur. XVII, i, 1835, 268.
Proctotretus chilensis, Dum. & Bibr. Erpét. gén. IV, 1837, 269.—Bell, Zool. Voy. Beagle, V, 1843, 2. Pl. i, fig. 1.—Guich. in *Gay*, Hist. de Chile, Zool. II, 1848, 24. Pl. ii, fig. 1.—Dum. Voy. Venus, Zool. 1855, 288. Pl. i, figs. 1 & 2.
Liolaemus chilensis, Fitz. Syst. Rept. I, 1843, 75.
Leiodera chilensis, Gray, Catal. Lizz. Brit. Mus. 1845, 210.
Liolaemus olivaceus (Wiegm.), Tsch. Faun. Peruan. Herp. 1845, 33.

Observ.—This species, though common in Chile, was not brought home by the Expedition. It has been admirably well figured in the French Voyages quoted in the synonymy, especially in the "Voyage de la Venus."

Subgenus PTYCHODEIRA (Dum. & Bibr.), Fitz.

Gen. Char.—Head subovate, anteriorly narrow. Cephalic plates moderate, not carinated; one series of supralabials. Nostrils lateral. Temporal scales imbricated and carinated. Auricular aperture simple, subgranular, or denticulated. Sides of neck longitudinally folded, covered with small, sublanceolated, carinated, and imbricated scales; no vertico-oblique scapular fold. Scales sub-

equal; dorsal and lateral ones large, subrhomboid, conspicuously carinated, and acuminated. Abdominal scales posteriorly entire. Posterior aspect of thighs wholly granular. Coloration: one or two longitudinal light streaks on each side, with or without intervening series of black spots.

Syn.—*Ptygodères*, Dum. & Bibr. Erpét. gén. IV, 1837, 273.—Dum. & A. Dum. Catal. méth. Rept. Mus. d'hist. nat. i, 1851, 72.
Ptychodeira, Fitz. Syst. Rept. I, 1843, 17 & 73.
Ptygoderus, Gray, Catal. Lizz. Brit. Mus. 1845, 216.

Observ.—In this subgeneric division the neck exhibits longitudinal folds, more or less distinct, but has no scapular fold, thus standing in close relations to *Liodeira* and *Liolaemus*, especially if we bear in mind that the sides of the neck are covered with scales similar to those of the body, though smaller. The imbricated and keeled temporal scales constitute another relative feature in this genus.

The species which it includes are more numerous, though further researches may reduce their actual number, and show some of them to be mere varieties of either one or the other.

1. Ptychodeira gracilis, Grd.

(Plate XVII, figs. 22–28.)

Spec. Char.—Cephalic plates smooth. Auricular aperture large, minutely denticulated. Supralabials nearly equal to the labials. Temporal scales moderate. Sides of neck but slightly wrinkled. Dorsal and lateral scales subequal. Abdominal scales smooth, sublanceolated. Tail very long and slender. Olivaceous-brown, with two longitudinal streaks on each side: uppermost superiorly lined with black. Sides speckled with black. Beneath pale, unicolor, except the chin and throat, which exhibit sometimes interrupted black lines.

Syn.—*Proctotretus gracilis*, Bell, Zool. Voy. Beagle, V, 1843, 4. Pl. i, fig. 2.
Leiodera gracilis, Gray, Catal. Lizz. Brit. Mus. 1845, 211.

Observ.—The resemblance of this species, in its general aspect, to *P. stantoni* is very striking, and still more so, when we consider its coloration, which is most similar.

Descr.—The head is very much depressed, declivous from the occiput to the snout, hence, wedge-shaped in its general appearance; seen from above, its outline is subovoid. The cephalic plates, polygonal as usual, smooth or subnodulous, are proportionally well developed. The frontals are the most conspicuous; they are symmetrically arranged in three pairs, the middle pair of which is the largest, inclosing two central odd plates upon the vertex. The vertex plate proper, however, does not come into contact with the latter, since the posterior frontals are contiguous upon their inner margin. Three occipitals constitute another conspicuous group, though more angular each than the frontals; the occipital pit is not conspicuous, but may be detected, as usual, upon the middle of the central plate. The group just alluded to is surrounded by a chain of smaller plates. Two or three supraoculars are considerably larger than the rest, the smallest of which constitute a subconcentric series, along the occipital, vertico-frontal, and supraciliary lines. Others, equally small, occupy the anterior external third of the supraocular region, either irregularly disposed, or arranged upon three oblique series. There are two pairs of fronto-nasals: the anterior pair being the smallest, subquadrangular, and in contact with the rostral; the posterior pair is subquadrangular also. We likewise observe two minute interfronto-nasals. The nasal, situated upon the prolongation of the supraciliary ridge, is pyriform; its narrowest extremity coming into contact with the rostral. The nostril is large and circular, situated near to its posterior margin. The rostral is transversely elongated, very low, and slightly convex upon its upper edge. We observe five elongated upper labials, largest upon the middle of the series. There is but one row of elongated and very exiguous supralabials, about five in number. Three angular and small plates occupy the loral region. There are but two suborbitals, a posterior, very small, scale-like, and a very elongated one, forming almost exclusively the inferior rim of the orbit. The surface of the eyelid is granular; its margin exhibits a double row of subquadrate, small plates. The temporal scales are well developed, and subcarinated or smooth. The symphyseal is very large, rounded upon its maxillary edge, otherwise angular. The lower labials are broader than the upper ones, but not quite so long: the fifth is very small; the succeeding ones can hardly be distinguished from the adjoining scales covering the throat, two series of which may be observed between the labials and the mental shields. The latter are quite developed, constituting four diverg-

ing pairs, diminishing in size posteriorly. The scales on the inferior surface of the head are subrhomboid, smooth, and entire upon their posterior margin. The neck is slightly contracted, and slightly wrinkled. The auricular aperture is large, vertically elliptical, provided with very small scales upon its anterior margin.

The body is slender and depressed. The limbs are slender also: the anterior, when stretched backwards alongside the body, overlap the two-thirds of the distance to the groins, whilst the posterior ones, when similarly brought forwards, will extend their longest toe beyond the shoulder. The tail is long and very slender, subconical, and tapering into a point, being more than twice the length of the body.

The dorsal scales are well developed, larger posteriorly than anteriorly, rhomboid or sublanceolated, and conspicuously carinated; on the tail, they are elongated, and disposed upon verticils, being carinated below as well as above. Upon the lower half of the sides, the scales are smooth, as well as on the abdomen; their shape is subrhomboid, and their posterior margin entire, not differing on the preanal region, except that they are smaller upon its periphery. The upper and anterior aspects of the fore-limbs are covered with carinated scales, similar to those on the anterior portion of the body. The axilla is granular. The posterior and inferior aspects of the forearm are provided with small and smooth scales. The latter are keeled under the arm, over the palm of the hand, and under the fingers; on the carpus, they are quite large and smooth, as also upon the fingers. The fingers are very slender, whilst the nails are moderate-sized. The inferior surface of the hind limbs is covered with large and smooth scales; on the upper surface, the scales are keeled, resembling those of the back. The groin and posterior aspect of the thigh are granular in appearance, so very minute are the scales which cover these regions. On the tarsus and upper surface of the toes, the scales are carinated, as well as beneath, and on the soles of the feet.

The upper regions, in the male, are uniform blackish-brown, with two light lateral streaks: the inferior regions being uniform yellowish-brown. In the female, the lateral streaks are whitish; the upper streak lined superiorly with a black fillet; there is also a dorsal series of small blackish spots, intervening between the two streaks. A whitish line may likewise be observed over the posterior aspect of the thigh, which is, at the same time, dotted with black. The inferior

regions are whitish or yellowish, with elongated brownish or blackish spots under the head and throat.

Loc.—The species is exceedingly abundant among the sandhills on the coast of Patagonia, where specimens were collected in February, 1839, when a colored sketch of the female was made by Mr. Drayton.

Plate XVII, fig. 22, represents the profile of the female of *Ptychodeira gracilis*, size of life.

Fig. 23, exhibits the same specimen, from beneath.

Fig. 24, is an upper view of the head;

Fig. 25, a front view of the same.

Fig. 26, the left hand, seen from above.

Fig. 27, a group of dorsal scales;

Fig. 28, a group of abdominal scales.

Figs. 24–28, are somewhat magnified.

2. Ptychodeira femorata, Grd.

Spec. Char.—Cephalic plates rugose. Auricular aperture moderate, denticulated. Supralabials much narrower than the labials. Temporal scales moderate. Sides of the neck slightly wrinkled. Dorsal scales diminishing in size towards the sides. Abdominal scales smooth, posteriorly rounded. Tail elongated and slender. Brownish, with two parallel light streaks on each side, and two series of black spots. Abdomen whitish, unicolor. Inferior surface of head exhibiting interrupted greyish lines.

Syn.—*Proctotretus femoratus*, Grd. in Proc. Acad. Nat. Sci. Philad. VII, 1854, 227; &, in *Gillis*, U. S. N. Astr. Exped. S. Hemisph. II, 1855, 219. Pl. xl, figs. 5–12.

Descr.—The head is depressed, and quite declivous from the frontal region towards the snout; viewed from above, it is subtriangular, subtruncated anteriorly. The cephalic plates are of moderate development, exhibiting, upon their surface, sinuating, subtubercular ridges, which give to that region a rugose appearance. The vertex plate, a pair of postoccipitals, and two pairs of postfrontals may be distinguished, amid their number, as larger than the rest. Three post-inter-

nal supraoculars hold the same relations towards their analogues as the former: a concentric chain being observed upon the inner margin of the supraocular region. The nostril perforates one single plate, more towards its posterior, or inferior edge, than the anterior. The loral region being considerably reduced by the declivity of the frontal region, there are but one or two loral plates. The suborbital chain is composed of three narrow and elongated plates, provided internally with a conspicuous and sharp ridge or crest; the longest occupying the inferior rim of the orbit; the other two, its anterior rim; whilst the posterior rim is formed by the anterior temporal scales. The supraciliary ridge is composed of five or six obliquely superposed plates, smallest posteriorly. The surface of the eyelid is granular: its margin being provided with a series of very small plates. The rostral is transversely elongated and very low. The upper labials are elongated and narrow, six in number, increasing in size from the first to the fourth, which is the longest, then diminishing again posteriorly. The supralabial series is composed of about an equal number of similar, though narrower, plates. The symphyseal is larger than the rostral, and especially broader upon its middle region. The lower labials, six or seven in number, are broader than the upper, diminishing gradually backwards. There are four pairs of mental shields: the anterior pair is the largest, contiguous upon their inner margins, whilst the other pairs diverge as well as diminish in size posteriorly. A series of infralabials may be traced from the angle of the mouth to between part of the first lower labial and the anterior mental shield. The temporal scales are well developed, particularly the uppermost; they are posteriorly obtuse, imbricated, and distinctly carinated. The sides of the neck, which exhibit a very obsolete fold, are covered with small, acute, and carinated scales. The posterior margin of the auricular aperture, and the scapular region, are minutely granular. The scales are rather large upon the back, diminishing in size towards the middle of the flanks, being carinated and acute posteriorly. The inferior half of the flanks is covered with scales similar to those which exist on the belly, being only somewhat smaller, and obsoletely carinated. The abdominal scales are smooth, posteriorly obtuse, and rather smaller than the dorsal ones; on the chin and throat, they do not differ materially from the abdominal ones, though somewhat larger on the chin than on the throat; their posterior margin is entire: if an obsolete notch is to be observed at all, it is in such as occupy the flanks.

That notch, however, is owing to the fact that the keels, which are obsolete there, do not always extend to the posterior margin of the scales. The upper surface of the anterior limbs is covered with scales, similar to, but smaller than those on the back, obtuse and smooth upon their anterior aspect and on the carpus; under the forearm they are very small and smooth, increasing in size under the arm, and again diminishing towards the palm of the hand, which is entirely covered with them, and not only carinated and posteriorly acerated, but provided also with a lateral acute process, particularly developed upon the metacarpal region. The fingers are plated and smooth above; they are provided beneath with small scales, carinated, acerated, and disposed upon regular transverse series. The hind limbs and the feet are covered above with scales similar but smaller than those on the back, and larger than on the fore-limbs, carinated even over the feet. The anterior aspect of the tibia and metatarsus exhibits very small, almost granular scales. The posterior aspect of the thighs is granular, whilst their inferior aspect is covered anteriorly with scales similar to those of the abdomen, and posteriorly with three or four series of subcarinated scales, somewhat acute, and projecting beyond the surface of these organs, the external series being the most developed. On the soles of the feet, the scales are quite small, acute, and more distinctly keeled. The toes are surrounded with small subverticillated scales, more uniform and more distinctly keeled beneath than above. The scales are somewhat larger at the base of the tail than on the back.

The ground color is olivaceous-brown or blackish. The upper surface of the head is either unicolor or dotted with blackish; its sides generally exhibit two or three oblique and black lines, extending from beneath the orbit towards either the margin, or the angle of the mouth. The suborbital ridge may be black also. There are two parallel light streaks, on the sides of the body: the uppermost extending from the supraciliary ridge to a portion of the tail; the lower one extends from the temporal region across the upper edge of the auricular aperture, and above the insertion of the fore-limb, to the groin. The dorsal region sometimes is lighter than the sides, having then the appearance of a broad streak. There are two series of black, transversely elongated spots, with a light margin: the intervening space being dark brown. The first series follows the inner edge of the upper streak; the second is inclosed between the two streaks. The lower half of the flanks, beneath the lower streak, is covered with irregularly vertical,

or rounded black spots. Beneath, the body is unicolor, whitish, or greyish; numerous interrupted series of linear spots are observed under the head. A black, irregular spot may be seen at the insertion of the fore-limbs. The series of dorsal spots extends along the upper surface and sides of the tail; the latter is maculated beneath with greyish. The limbs above are transversely barred, and beneath of the same hue as the abdomen.

In some, probably male specimens, the streaks and spots are less distinct, immerging into the ground color. The sides of the abdomen being of a reddish metallic hue, with black and bluish small spots.

Loc.—One specimen was collected at Valparaiso, Chile.

3. Ptychodeira stantoni, Grd.

Spec. Char.—Cephalic plates rugose. Auricular aperture moderate, subdenticulated. Supralabials exiguous, elongated. Temporal scales large. Sides of neck slightly wrinkled. Dorsal and lateral scales subequal. Abdominal scales slightly keeled, posteriorly rounded. Tail elongated and slender. Deep reddish-brown posteriorly, with two light streaks on each side; beneath unicolor.

Syn.—*Proctotretus stantoni*, Grd. in Proc. Acad. Nat. Sci. Philad. VII, 1854, 227; &, in *Gilliss*, U. S. N. Astron. Exped. S. Hemisph. II, 1855, 221, Pl. xl, figs. 13–20.

Observ.—No specimens of this species having been collected by the naturalists of the Expedition, we have simply recalled its characteristic features to serve here as terms of comparison.

Loc.—Has been observed in the neighborhood of Santiago, Chile.

4. Ptychodeira cyanogaster, Grd.

Spec. Char.—Cephalic plates smooth or slightly wrinkled (rumpled). Supralabials quadrilateral, oblong. Temporal scales moderate. Auricular aperture large, simple. Sides of neck conspicuously

wrinkled, granular within the folds, and scaly exteriorly. Dorsal and lateral scales subequal. Abdominal scales smooth, subelliptical, posteriorly rounded. Tail very long, thick, and depressed at the base, conical and tapering posteriorly. Greenish-brown or coppery, with a yellow streak on each side of the back; beneath bluish, unicolor.

Syn.—*Proctotretus cyanogaster*, Dum. & Bibr. Erpét. gén. IV, 1837, 273.—Bell, Zool. Voy. Beagle, V, 1843, 12. Pl. v, fig. 2.—Guich. in *Gay*, Hist. de Chile, Zool. II, 1848, 28. Lam. II, fig. 2.—Dum. Voy. Venus, Zool. 1855, 292. Pl. II, fig. 2.
Liolaemus (Liodeira) cyanogaster, Fitz. Syst. Rept. I, 1843, 74.
Liolaemus cyanogaster, Gray, Catal. Lizz. Brit. Mus. 1845, 212.

Observ.—This species, like the preceding one, is not represented in the collection made by the U. S. Exploring Expedition: hence, a fuller description is not deemed here in place.

Loc.—Observed upon various points in Chile.

5. Ptychodeira intermedia, Grd.

Spec. Char.—Supralabials well developed. One series and a half of infralabial plates. Mental shields very numerous. Auricular aperture large, and simple in front. Temporal scales large. Abdominal scales rather broad, and rounded posteriorly. Tail long and slender. Dorsal region and flanks blackish-brown, with two longitudinal yellowish-brown streaks, one along the upper portion of the flanks, from the orbit to some distance along the tail, the other from the auricular aperture to the groin. Upper surface of head, limbs, and tail olivaceous-brown. Beneath unicolor.

Syn.—*Proctotretus intermedius*, Dum. Voy. Venus, Zool. 1855, 290. Pl. II, fig. 1.

Observ.—This species resembles *P. cyanogaster*, to which it is closely related. It differs mainly by the proportional development of its cephalic and loral plates, and a more extended series of mental shields, which may be traced almost to the throat. Its abdominal scales are likewise broader posteriorly, being subrhomboid in their outlines. In the "Catalogue méthodique de la Collection de Reptiles du Muséum d'histoire

naturelle, 1851, 72," *P. intermedia* was erroneously considered as identical with *P. mosaica*. It is admirably figured in "Du Petit Thouars' Voyage de la Venus," but not described as fully as might be desirable in the present state of our Knowledge.

Loc.—Republic of Chile.

6. Ptychodeira mosaica, Grd.

Spec. Char.—Labials much larger than the supralabials. Two large lorals, and two small postnasals. Five or six pairs of mental shields. Temporal scales moderate. Auricular aperture subtubercular. Abdominal scales posteriorly rounded. Dark brown; middle region of the back light brown; two light streaks, and two series of black subquadrate spots, on each side.

Syn.—*Proctotretus mosaicus*, Hombr. & Jacq. Voy. au Pole Sud et dans l'Océanie. Rept. Sauriens. Pl. II, fig. 1.—Guich. in *Gay*, Hist. de Chile, Zool. II, 1848, 26.—Dum. & A. Dum. Catal. méth. Rept. Mus. d'hist. nat. I, 1851, 72.

Observ.—In the "Catalogue méthodique des Reptiles du Muséum d'histoire naturelle," Messrs. Duméril consider this species as identical with *P. intermedia*, subsequently, however, given as a distinct species. The latter is more closely allied to *P. cyanogaster* than to any other we are so far acquainted with.

Loc.—Republic of Chile.

Subgenus RHYTIDODEIRA, Girard.

Char. gen.—*Scutis cephalicis modicis, amplioribus, non imbricatis, laevibus. Unica serie scutorum supralabialium. Naribus lateralibus. Squamis temporalibus imbricatis, laevibus, vel subcarinatis. Aurium margine anteriore granuloso, tuberculato, vel subdenticulato. Colli lateribus plicatis, granulosis; plicatura scapulari vertico-obliqua nulla. Squamis dorsualibus rhomboideis, carinatis, acuminatis; abdominalibus rhomboideis, laevibus, postice plerumque integris.*

Femorum facie posteriori vel omnino granulosa, vel squamis parvis imbricatis, prope basim caudae, tecta. Corpore vittis longitudinalibus varii coloris, quibus macularum series permiscuntur, notato; interdum tamen transverse fasciato.

Gen. Char.—Cephalic plates moderate, rather well developed, not imbricated, smooth; one series of supralabials. Nostrils lateral. Temporal scales imbricated, smooth, or subcarinated. Auricular aperture granular, tubercular, or subdenticulated in front. Sides of neck wrinkled, granular; no vertico-oblique scapular fold. Dorsal scales rhomboid, carinated, acuminated; abdominal scales rhomboid, smooth, generally entire posteriorly. Posterior aspect of thighs either wholly granular or provided with a patch of small scales near the tail. Coloration: longitudinal streaks of various hues, with intervening series of spots, occasionally, however, transversely banded, instead of being streaked.

Syn.—*Rhytidodeira*, Grd. in Proc. Acad. Nat. Sci. Philad. November, 1857, 198.

Observ.—Differs from *Ptychodeira*, its nearest relative, by smooth temporal scales, and the presence, on the sides of the neck, of granules, instead of small scales, such as are observed on the body. The folds or wrinkles are also more conspicuously developed in *Rhytidodeira* than in *Ptychodeira*.

1. Rhytidodeira kingi, Grd.

Spec. Char.—Body robust and full. Head short and thick; snout rounded. Supralabial plates oval, moderate-sized. Temporal scales moderate-sized, somewhat raised. Auricular aperture large, oval, granular, or subdenticulated in front. Dorsal and lateral scales subequal, moderate; abdominal ones posteriorly rounded and entire. Posterior aspect of thighs granular, with a patch of small scales near the tail. Rich dark brown above, with transverse, whitish, black-margined bands and spots. Beneath yellowish-white, with dark spots; throat bluish-grey, with white spots.

Syn.—*Proctotretus kingii*, Bell, Zool. Voy. Beagle, V, 1843, 13. Pl. vi, fig. 1.
Liolaemus kingii, Gray, Catal. Lizz. Brit. Mus. 1845, 215.

Rhytidodeira kingii, GRD. in Proc. Acad. Nat. Sci. Philad. November, 1857, 198.

OBSERV.—Not met with by the U. S. Exploring Expedition, and having no specimens at our command, it is not deemed expedient to enlarge upon this species.

LOC.—Port Desiré, Patagonia.

2. RHYTIDODEIRA MAGELLANICA, Grd.

SPEC. CHAR.—General form thickish and short. Head rather small; snout short and obtuse. Cephalic plates somewhat convex; supralabials smaller than the labials. Five very small lorals, and two small postnasals. One series of infralabials. Four pairs of mental shields. Temporal scales small and smooth. Auricular aperture small, bituberculated in front. Abdominal scales posteriorly rounded. Posterior aspect of thighs wholly granular. Tail rather short. Blackish-brown above, with five longitudinal white streaks, between which may be observed series of irregularly quadrangular, jet-black spots, anteriorly and posteriorly margined with white.

SYN.—*Proctotretus magellanicus*, HOMBR. & JACQ. Voy. au Pole Sud et dans l'Océanie. Pl. II, fig. 2; &, B b b'.—GUICH. in *Gay*, Hist. de Chile, Zool. II, 1848, 46.—DUM. & A. DUM. Catal. méth. Rept. Mus d'hist. nat. I, 1851, 75.

Proctotretus kingii, BELL, Zool. Voy. Beagle, V, 1843. Pl. VI, fig. 2.

Rhytidodeira magellanica, GRD. in Proc. Acad. Nat. Sci. Philad. November, 1857, 198.

OBSERV.—This is a very handsome species, next to *P. splendidus* in beauty, though of a very different style. Here, no metallic reflections, no glittering of iridescent hues, but simply the white and black, so distributed as to produce a most pleasing effect to the eye. It is admirably figured in the "Voyage au Pole Sud et dans l'Océanie." It was not secured by the Exploring Expedition, which, during its stay at Tierra del Fuego, "met no reptile of any kind."

LOC.—Pecket Harbor, Strait of Magellan, and Port Desiré, Patagonia.

3. Rhytidodeira bibroni, Grd.

Spec. Char.—Body subfusiform, moderately slender. Head rather short, obtuse, covered with rather well-developed, convex plates. Supralabials elongated, quadrangular, nearly equal to the labials. Auricular aperture moderate, oval, unidentated. Temporal scales rounded. Dorsal and lateral scales subequal, large; abdominal ones rounded and entire. Posterior aspect of thighs wholly granular. Brownish-grey, with a black longitudinal line along the middle of the back and tail. Two series of black spots on each side, and a small interrupted fascia, of the same color, from the shoulder to the thigh. Limbs maculated with black. Belly of a uniform dirty white.

Syn.—*Proctotretus bibronii*, Bell, Zool. Voy. Beagle, V, 1843, 6. Pl. III, fig. 1.
Liolaemus bibronii, Gray, Catal. Lizz. Brit. Mus. 1845, 212.
Rhytidodeira bibroni, Grd. in Proc. Acad. Nat. Sci. Philad. November, 1857, 198.

Observ.—Of this very characteristic species, no specimens were obtained by the U. S. Exploring Expedition.

Loc.—Port Desiré, Patagonia.

4. Rhytidodeira wiegmanni, Grd.

Spec. Char.—Head rather short; snout obtuse and rounded. Two series of supralabial plates, smaller than the labials. Auricular aperture moderate, granular in front. Dorsal and lateral scales subequal, moderate; abdominal ones rounded and entire. Posterior aspect of thighs granular, with a patch of scales near the tail. Above greyish, with a fawn band on each side, situated between two series of angular black spots. A black streak, margined with white, along the thigh.

Syn.—*Proctotretus wiegmannii*, Dum. & Bibr. Erpét. gén. IV, 1837, 284.—Guich. in *Gay*, Hist. de Chile, Zool. II, 1848, 36.—Dum. Voy. Venus, Zool. 1855, 295. Pl. III, fig. 2.
Ptychodeira wiegmanni, Fitz. Syst. Rept. I, 1843, 73.
Rhytidodeira wiegmanni, Grd. in Proc. Acad. Nat. Sci. Philad. November, 1857, 198.

OBSERV.—Not among the reptiles collected by the U. S. Exploring Expedition.

LOC.—Republic of Chile.

5. RHYTIDODEIRA NIGROMACULATA, Grd.

SPEC. CHAR.—Head short; snout rounded and obtuse. Supralabial plates quadrangular and well developed. Temporal scales large, superiorly keeled, inferiorly smooth. Scales, on sides of neck, thick and rhomboid; lateral and abdominal scales smaller than the dorsal ones, and posteriorly emarginated. Posterior aspect of thighs wholly granular. Tail rather short. Greyish-fawn, with two series of angular black spots on each side; a large scapular black patch; thighs posteriorly black-dotted.

SYN.—*Tropidurus nigromaculatus*, WIEGM. in Nov. Act. Acad. nat. cur. XVII, I, 1835, 229.

Proctotretus nigromaculatus, DUM. & BIBR. Erpét. gén. IV, 1837, 281.—BELL, Zool. Voy. Beagle, V, 1843, 10. Pl. IV, fig. 2.—GUICH. in *Gay*, Hist. de Chile, Zool. II, 1848, 34.—DUM. Voy. Venus, Zool. 1855, 293. Pl. III, fig. 1.

Ptychodeira nigromaculata, FITZ. Syst. Rept. I, 1843, 73.

Liolaemus nigromaculatus, GRAY, Catal. Lizz. Brit. Mus. 1845, 213.

Rhytidodeira nigromaculata, GRD. in Proc. Acad. Nat. Sci. Philad. November, 1857, 198.

OBSERV.—This species was not amongst those collected by the U. S. Exploring Expedition, and hence, is here not further described.

LOC.—Republic of Chile.

6. RHYTIDODEIRA OXYCEPHALA, Grd.

(Plate XXVIII, figs. 26–33.)

SPEC. CHAR.—Head very much depressed, rather short; snout rather narrow, though rounded off upon its periphery. Labial and supralabial plates narrow and elongated; supralabials smaller than the labials. Auricular aperture large, granular in front. Temporal

scales large and smooth. Sides of the neck coarsely granular. Dorsal scales larger than the lateral and abdominal ones; lateral scales keeled; abdominal scales posteriorly rounded and entire. Posterior aspect of thighs wholly granular. Yellowish-brown, with a dorsal black line, on each side of which is a series of transversely elongated, and oblique, blackish-brown spots, posteriorly white-margined; sides variegated with brown and white. Beneath blackish-grey; chin and throat white-dotted; abdomen unicolor.

Syn.—*Tropidurus oxycephalus*, Wiegm. in Nov. Act. Acad. nat. cur. XVII, i, 1835, 232.

Liolaemus oxycephalus, Gravenh. in Nov. Act. Acad. nat. cur. XVIII, ii, 1838, 735. Pl. liv, fig. 13.

Rhytidodeira oxycephala, Grd. in Proc. Acad. Nat. Sci. Philad. November, 1857, 198.

Observ.—This species is allied to *R. nigromaculata*, from which it chiefly differs by a narrower snout, more exiguous labials and supralabials, and entire abdominal scales, which are posteriorly rounded off.

Descr.—The cephalic plates stand as follows: two pairs of internals, the anterior smaller than the posterior; two pairs of frontonasals, a middle one, contiguous, in size and shape like the posterior pair of internasals, and a smaller pair, situated exteriorly to the former; three pairs of frontals; two prefrontal pairs: the middle one largest, elongated, with two small subhexagonal interfrontals between them, the foremost a little larger, and engaging somewhat between the fronto-nasal, the external pair slender, exiguous; the postfrontal pair, subpentagonal, and shorter than the middle prefrontals, are contiguous, admitting slightly the hindmost interfrontal between the anterior portion of their commissure; a vertex plate, elongated, laterally subconcave, and posteriorly tapering; four pairs of small subequal parietals, the foremost contiguous, interposing between the vertex plate and the middle occipital, the others diverging between the occipitals and supraoculars; a middle occipital, inclosed by the two anterior pairs of parietals and a pair of rather well-developed postoccipitals, contiguous upon their inner edge; one pair of latero-occipitals, situated sideways of the postoccipitals; finally, a semicircular chain of small transversely elongated plates interposes between the temporal scales, on one hand, and the scales of the neck, on the other hand.

Now, as to the supraoculars: the posterior four middle ones are

conspicuously larger than the rest of the same name; they are, as usual, polygonal, transversely elongated; in the concentric chain, they are subequal, and slightly larger than in the longitudinal series, which interposes between the middle ones and the supraciliary chain. The latter is composed of six, thin, tiled laminae, immediately above the eye, and a thicker one upon the side of the snout. A subpyriform nasal, posteriorly perforated by the nostril, would be placed within the supraciliary ridge, if the latter was extended forwards; it is contiguous, by its narrow extremity, to the rostral. There are two exiguous supranasals, placed one in advance of the other, and three very small, unequal postnasals. The inferior edge of the nasal plate is contiguous to the supralabial series.

On the loral region, we observe but two small plates, that we can call by that name, an anterior one, subtriangular, extending upwards in front of the supraciliary ridge, and might be numbered as one of that series, and a posterior one, somewhat smaller, pentagonal, or polygonal. Two anteorbitals: the uppermost is situated in advance of the elongated suborbital; the lower one, elongated, is placed immediately beneath the upper, smaller than the latter, and does not enter into the orbit. At the posterior rim of the orbit, there are two small, scaly plates, behind the suborbital; the rest is formed by the anterior scales of the temporal region. The supralabials, five or six in number, are narrow, elongated, and somewhat smaller than the labials: the anterior one is smaller than the rest, which increase in size to the fifth or sixth, the latter not extending as far as the suborbital.

The rostral is quite narrow, transversely elongated. The upper labials, six or seven in number, increase in size posteriorly to the fifth or sixth; the last is less regularly linear than the rest in the series, being also generally the smallest. The symphyseal is hemidiscoid, and larger than the rostral. The lower labials, five on either side, gradually diminish in size backwards, being anteriorly larger than the upper labials. We observe one series of infralabials, and four pairs of mental shields: the anterior pair, as usual, contiguous upon their inner edges. The scales, on the remaining portion of the chin and on the throat, are subequal, smooth, subrhomboid, posteriorly emarginated, and somewhat less developed than on the abdomen. The temporal scales are rather large and smooth. The scales are subequal on the back and abdomen; on the flanks, smaller; the former keeled and acuminated; the latter subacuminated and obsoletely keeled; the

abdominal ones smooth, rounded, and some of them emarginated posteriorly; on the tail, larger than on the back; under that organ, smooth near the base, keeled further towards the apex.

A colored sketch having been made in May, 1839, we have thus before us the unchanged tints of, at least, one stage of growth of this species. The ground color above is yellowish-brown: the upper surface and sides of the head being unicolor. A black line may be traced along the middle region of the back, on each side of which, and contiguous to it, is a series of dark brown, transversely elongated, oblique spots, posteriorly margined with white; their direction being downwards and forwards from the dorsal line. These spots may still be observed on the base of the tail, though gradually disappearing, leaving, to a certain distance, the middle line isolated, which also fades away before it reaches the tip of that organ. The upper portion of the flank exhibits a series of broken-up spots, likewise edged with white posteriorly, and extending from the axilla to the groin. Upon the middle portion of the flank may be observed a series of small, white spots, whilst the lower portion of the same region is of a uniform brownish-gold hue. The inferior surface of the head is dark bluish-black, white-speckled. The abdomen and lower aspect of the limbs are light bluish-black also, though unicolor. The tail beneath being yellowish.

Loc.—From the middle region of the Cordilleras, at an altitude of eight thousand feet.

Plate XXVIII, fig. 26, represents *Rhytidodeira oxycephala*, size of life.

Fig. 27, is an upper view of the head;
Fig. 28, a profile of the same;
Fig. 29, the head, seen from beneath.
Fig. 30, the left hand, from above;
Fig. 31, the same hand, from beneath.
Fig. 32, a group of dorsal scales;
Fig. 33, a group of abdominal scales.
Figs. 27–33, are somewhat magnified.

Subgenus EULAEMUS, Girard.

Char. gen.—*Scutis cephalicis modicis vel amplioribus, laevibus; supralabialibus in unicam seriem dispositis. Naribus lateralibus. Squamis temporalibus subimbricatis, subcarinatis, vel laevibus. Apertura auditoria magna, ejus anteriori margine denticulato vel tuberculoso. Colli lateribus plicatis et granulosis. Plicatura scapulari vertico-obliqua. Squamis dorsualibus modicis, subrhomboideis, leviter carinatis, postice obtusis; lateralibus minoribus, vel subaequalibus; abdominalibus rhomboideis, vel rotundis et integris. Tota femorum facie posteriori granulosa, vel minutissime squamata. Colore fuscato, cum transversis nigris vel fuscis maculis, vel fasciis plerumque claro marginatis, interdum tamen vittis longitudinalibus obsoletis.*

Gen. Char.—Cephalic plates moderately, or else well developed, smooth; one series of supralabials. Nostrils lateral. Temporal scales subimbricated, subcarinated, or smooth. Auricular aperture large, denticulated, or tubercular in front. Sides of the neck wrinkled and granular; a vertico-oblique scapular fold. Dorsal scales moderate, subrhomboid, slightly carinated, posteriorly obtuse; lateral ones rather smaller, or subequal; abdominal scales rhomboid, or rounded, and entire. Posterior aspect of thighs wholly granular, else minutely scaly. Coloration: transverse black, or brown, generally light-margined spots, or bands, upon a rather dark ground; longitudinal streaks obsolete, if at all present.

Syn.—*Eulaemus*, Grd. in Proc. Acad. Nat. Sci. Philad. November, 1857, 198.

Observ.—The sides of the neck are wrinkled and granular, as in *Rhytidodeira*, but there is, in addition, a vertico-oblique fold in advance of the shoulder, and which is wanting in the latter. The dorsal scales are smaller also, but slightly carinated, the keels not protruding beyond the posterior edge of the scales, which is rounded, instead of being acuminated.

1. Eulaemus tenuis, Grd.

(Plate XXVIII, figs. 9–16.)

Spec. Char.—Cephalic plates usually smooth, occasionally covered with minute granules. Auricular aperture anteriorly subtubercular. Supralabials smaller than the labials. Temporal scales moderate, subcarinated. Two series of infralabials. Four pairs of mental shields. Dorsal scales small; lateral scales smaller, not imbricated, obscurely keeled; abdominal scales smooth. Posterior aspect of thighs wholly granular. Tail long and slender. Brownish-black above, with transverse, subcrescentic, black bands; beneath variegated.

Syn.—*Proctotretus tenuis*, Dum. & Bibr. Erpét. gén. IV, 1837, 279.—Bell, Zool. Voy. Beagle, V, 1843, 7. Pl. III, fig. 2.—Guich. in *Gay*, Hist. de Chile, Zool. II, 1848, 32. Erp. Lam. I, fig. 1.—Hombr. & Jacq. Voy. au Pole Sud et dans l'Océanie. Pl. II, bis, fig. 2.—Grd. in *Gilliss*, U. S. N. Astron. Exped. S. Hemisph. II, 1855, 217. Pl. XL, figs. 1–4.

Liolaemus (Liodeira) tenuis, Fitz. Syst. Rept. I, 1843, 74.

Liolaemus tenuis, Gray, Catal. Lizz. Brit. Mus. 1845, 214.

Liolaemus punctatus, Gray, MSS. Brit. Mus. 1836.

Eulaemus tenuis, Grd. in Proc. Acad. Nat. Sci. Philad. November, 1857, 198.

Descr.—The form, although slender in its general appearance, is less a characteristic of this species than it really is for several others of its congeners. The body is depressed; swollen upon its middle region; the limbs being moderate-sized: the anterior pair, when stretched alongside the body, is far from attaining the groins, and the tip of the longest toe of the posterior pair, when brought forwards, reaches the middle region of the neck. The tail is elongated, conical, tapering into a point, and nearly twice as long as the body and head together. The tongue is large and fleshy, elongated and depressed, sublanceolated, occupying the whole space between the two branches of the lower jaw. The teeth are of moderate development, smallest anteriorly, and subcylindrical; whilst posteriorly, they are somewhat compressed, or else stouter at the base.

The head is depressed, subtriangular when viewed from above, and rounded upon the snout. The plates, which cover its surface, are generally smooth, but exhibit sometimes a very minute granulation, apparent only through a magnifying glass. The cephalic plates, pro-

perly so called, vary as regards both size and number, being smallest when most numerous. In the specimen figured, there are three pairs of frontals, one pair of postoccipitals, an odd occipital, a vertex plate, and an odd frontal, which are somewhat larger than the rest, and nearly equal-sized. An inner series of supraoculars may be noticed as the next in size, separated from the vertex plate and the occipitals by a concentric series of smaller plates. There is but one, rather small, nasal, in the midst of which the nostril opens, leaving but a narrow rim. The loral region is occupied by several small plates. The anterior suborbitals are more developed than the posterior one, all of which being provided with a keel along their inner margin. The supraciliary ridge is composed of about six elongated, narrow, and obliquely superposed plates. The eyelids are covered with very small plates, the marginal series being somewhat more developed than the rest, except upon the periphery. The rostral is transversely elongated and very low. The upper labials are very much elongated and narrow, six or seven in number, increasing in length from the first to the fourth inclusive, diminishing again considerably backwards. The supralabials have the same general appearance as the labials, save in being somewhat smaller. Occasionally, two or more minute plates may be observed upon the loral region, between the loral plates proper and the supralabials. The temporal scales are of moderate size, and nearly equal to the postoccipitals; they are irregularly rounded, slightly imbricated, and provided either with a rudimentary tubercle or an obsolete keel. The symphyseal is larger than the rostral, and especially broader upon its middle region. The lower labials, five or six in number, are broader than the upper, more conspicuous therefore, and diminishing gradually backwards. There are four or five pairs of mental shields: the anterior pair being the largest, and contiguous upon their inner margin, whilst the other pairs diverge, and diminish gradually in size backwards. Between the mental shields and lower labial plates there exists a complete series, and part of a second, of small infralabials. The chin, the throat, the belly, the preanal region, thighs, and legs, are covered with smooth, posteriorly obtuse, and mostly entire scales, of moderate development, somewhat smaller on the chin, and larger under the hind limbs; a few on the sides of the belly exhibiting a small notch posteriorly. The sides of the neck, the insertion of the limbs, the inferior surface of the forearm, and the posterior surface of the thighs, are granular.

On the sides of the abdomen, the scales are irregularly rounded, subtuberculous, or subcarinated, and smaller than those of the dorsal region, which are distinctly, though moderately, carinated, and posteriorly obtuse. The upper surface of the limbs, and the inferior surface of the arm, are covered with scales similar in shape and structure to those on the back; on the palm of the hands and the sole of the feet, they are much smaller, posteriorly acute, and distinctly carinated; around the fingers and toes, they constitute irregular verticils: the superior ones varying more in size, and are less distinctly carinated than the inferior. The inner or first finger is the smallest; the outermost is the next in length; then the second; the third is nearly as long as the fourth, which is the longest. The nails are rather short, compressed, acerated, and gently curved. The first toe is the smallest; the second is the next in length; then the fifth; then the third; the fourth being the longest. Their nails do not differ materially from those at the fingers. The scales which cover the tail are most conspicuous of all; they constitute oblique series upon the base of that organ, and annular rows further backwards. The oblique series have the same shape as those on the back. Those constituting the annular rows or verticils are superiorly subquadrangular and elongated, with an oblique keel, whilst beneath, they become much narrower, posteriorly acute, with a straight keel along their middle region.

The ground color is blackish-brown in the male, and greenish-brown in the female. In either sex, there are two parallel series of transverse black spots, convex anteriorly, white-margined, with a whitish, or else a lighter tint along their concavity. These spots, however, are more conspicuous in the female than in the male; they may be traced from the head, on each side of the dorsal region, to the posterior extremity of the body, where the series, from either side, combine more or less into one, and, as such, extends along the upper region of the tail. The limbs, as well as the tail, are transversely barred with black. In the female, the dorsal region and the flanks are either dotted with black or spotted with whitish; whilst in the male, the spots are either bluish, reddish, or else of a metallic green, especially on the neck. The upper surface and sides of the head are spotted with different shades of black, or dotted with yellow and black. The occipital region and the back, in the male, occasionally exhibit sinuating black lines upon a brownish ground, over which are bluish, greenish, or slate-colored spots. Beneath, the ground color is whitish, vermiculated, maculated,

or clouded with greyish lines, spots, or dots. That region, sometimes, is unicolor in the female.

The specimen figured was sketched and colored from life in May, 1839.

Loc.—Caught in the neighborhood of Valparaiso, Chile.

Plate XXVIII, fig. 9, represents *Eulaemus tenuis*, size of life.
Fig. 10, is an upper view of the head;
Fig. 11, a profile view; and,
Fig. 12, an under view of the same region.
Fig. 13, the right hand, seen from above;
Fig. 14, the same, seen from beneath.
Fig. 15, exhibits a group of dorsal scales;
Fig. 16, a group of abdominal scales.
Figs. 10–16, are somewhat magnified.

2. EULAEMUS DARWINI, Grd.

(Plate XVII, figs. 8–14.)

SPEC. CHAR.—Cephalic plates minutely granular. Supralabials nearly equal to the labials. Temporal scales subcarinated. Auricular aperture subtubercular. Three series of infralabials. Six or seven pairs of mental shields. Dorsal and lateral scales subequal, all keeled; abdominal scales rather larger, subrhomboid, subacuminated, emarginated on the sides of the belly. Posterior aspect of thighs granular, with a patch of scales near the tail. Tail moderate, subconical, and pointed. Greyish-brown, with two light longitudinal streaks on each side, and four series of quadrangular black spots, posteriorly margined with white; beneath yellowish-white; throat black in the male.

SYN.—*Proctotretus darwinii*, BELL, Zool. Voy. Beagle, V. 1843, 14. Pl. VII, figs. 1–2.
Liolaemus darwinii, GRAY, Catal. Lizz. Brit. Mus. 1845, 215.
Eulaemus darwini, GRD. in Proc. Acad. Nat. Sci. Philad. November, 1857, 198.

OBSERV.—Had we had for our sole guidance the figures given in the Zoology of the Beagle, we would have hesitated identifying this species.

Finding, however, that Bell's description, as far as it goes, applies to it almost strictly, we give it under the above name.

Descr.—The head is subdepressed, declivous upon the frontal region: the snout being obtuse and rounded; it is separated from the body by a somewhat contracted neck. The body itself is subdepressed also, convex above, flattened beneath, and somewhat broader than deep. The limbs are of moderate development: the anterior ones much more slender than the posterior. When the latter are brought forwards in a line with the body, the tip of the longest toe is made to reach the shoulder, whilst the anterior limbs, directed backwards, extend to two-thirds of the distance to the groins. The tail, subconical, slightly depressed upon its base, and tapering into a point, is one-fifth longer than the body and head together.

The cephalic plates are subtubercular, nearly smooth, and irregular in size and shape, all of moderate development: the largest ones may be observed upon the occipital and frontal region. There is a middle row of transversely elongated supraoculars, nearly as conspicuous as the ones just mentioned, and surrounded, along the region of the vertex, by one chain of smaller plates, forming an arc or semicircle, and, along the supraciliary line, by a double series of still smaller plates. The supraciliary ridge itself is composed of nine plates: six thin lamelliform, superposed above the eye, and three stoutish, keeled ones, placed in advance of the orbit, continuing the ridge to the upper labials. The nasal, subpyriform, is situated upon that ridge, with the nostril towards its posterior margin, which is the broadest; it is separated from the rostral by the anterior supralabial and a small internaso-rostral. The rostral is very much depressed, subconvex, or rounded above, and nearly linear sideways and beneath. The upper labials, eight in number, slightly increasing in size posteriorly, are generally longer than deep. The supralabials, which constitute but one series, are eight in number, similar in size and shape to the upper labials, with this exception, that the three posterior are the smallest of the series. There are three suborbitals: the middle one is as usually much the longest; the anterior is shorter and wider than the posterior. Three small loral plates may be observed between the supralabials, the suborbitals, and supraciliaries. The surface of the eyelid is granular, whilst its margin is provided with a double row of small subquadrangular plates. The temporal region is covered with small scales, sub-

carinated, and apparently smooth. The symphyseal is subpentagonal, with its base towards the margin of the jaw. The lower labials are seven in number, larger than the upper labials upon the middle of the series, diminishing in size both anteriorly and posteriorly. We observe six pairs of mental shields, diminishing in size posteriorly. There are two or three series of elongated scales, between the latter and the lower labials. The scales which cover the throat are apparently smaller than on the belly, since they are truncated and rounded posteriorly, but are similarly notched or bicuspid. There is a longitudinal fold along the middle region of the side of the neck, which is sometimes transversely undulated; also a small vertical fold in advance of the shoulder. The entire area, from the auricular aperture to the shoulder, is granular. The aperture just alluded to is well developed, vertically elliptical, and provided in front with granules, instead of scales.

The dorsal scales are of moderate development, keeled, and posteriorly rounded: the carination being not very conspicuous; they are smaller along the middle of the back than on its sides, and smaller still upon the neck than farther behind. The regions of the axillae and groins are almost granular, so much is the size of the scales reduced. The abdominal scales are a little smaller than those on the middle of the flanks; they are irregular in their outline, though generally rounded upon their posterior margin, which is entire. The posterior margin of the scales occupying the middle of the flanks, on the other hand, is notched or else bifid. The scales are smaller on the periphery of the preanal region than upon its middle; they are most conspicuous on the tail, subverticillated, and more strongly and obliquely carinated. The preanal margin is straight; we observe eight or ten preanal pores.

On the anterior and upper aspects of the forearm, the scales are sublanceolated, carinated, and larger than those on the back; the posterior and inferior aspects are granular; around the arm and on the hand, they are more truncated than the former, appearing consequently smaller; they are keeled above, and smooth beneath, as well as on the hand, whilst they again are keeled on the palm of the hand, where they are quite small. The scales which protect the fingers are keeled also, more conspicuously beneath than above. The upper aspect of the hind limbs is covered with keeled scales, and smooth ones beneath. The posterior aspect of the thigh is granular, except a small

area near the tail, which is covered with small scales. The toes, like the fingers, are very slender, and covered by similar scales.

The ground color is blackish-grey or brown; the upper surface of the head and neck sometimes uniformly so, and at others, dotted with white and black. There are two light longitudinal streaks on each side: the uppermost is brownish-yellow, inclosing two dorsal series of quadrangular black patches, separated transversely by a yellowish or whitish spot or bar; these spots sometimes alternate, at others are placed opposite to one another; they are either distinct upon their inner margin or else contiguous. Another series of quadrangular black patches is observed along the flanks, between the two light streaks; they are likewise separated by a transverse, yellowish, or whitish bar. The upper aspect of the limbs is maculated with black and white, or yellowish. The inferior surface of the head, body, limbs, and tail, is uniform whitish, or dull yellow, except in the male, in which the lower part of the neck is provided with a black, somewhat diffused blotch.

Loc.—Specimens of this species were collected on the 10th of February, 1839, on the coast of Patagonia, one of which was sketched from life by Mr. Drayton. They are said to be quite abundant among the sandhills.

Plate XVII, fig. 8, represents *Eulaemus darwini*, in profile and size of life.

Fig. 9, exhibits the same specimen, from beneath.

Fig. 10, is the head, seen from above;

Fig. 11, a front view of the head.

Fig. 12, left hand, seen from above.

Fig. 13, a group of dorsal scales;

Fig. 14, a group of abdominal scales.

Figs. 10–14, are somewhat magnified.

3. Eulaemus pictus, Grd.

Spec. Char.—Head pyramido-quadrangular; snout narrow. Temporal scales small, hexagonal, subcarinated. Auricular aperture rather large, tubercular in front. Dorsal scales rhomboid; lateral scales

somewhat smaller, and nearly smooth, or obsoletely carinated; abdominal scales posteriorly rounded. Posterior aspect of thighs wholly granular. Coloration variable.

SYN.—*Proctotretus pictus*, DUM. & BIBR. Erpét. gén. IV, 1837, 276.—BELL, Zool. Voy. Beagle, V, 1843, 5. Pl. II, figs. 1 & 2.—HOMBR. & JACQ. Voy. au Pole Sud et dans l'Océanie. Pl. II, bis, fig. 1.—GUICH. in *Gay*, Hist. de Chile, Zool. II, 1848, 30. Erp. Lam. I, fig. 2.

Liolaemus bistriatus, GRAY, Brit. Mus. 1836.

Liolaemus lemniscatus, GRAVENH. in Nov. Act. Acad. nat. cur. XVIII, ii, 1838, 731. Pl. LIV, fig. 12.

Liolaemus (Liodeira) pictus, FITZ. Syst. Rept. I, 1843, 74.

Liolaemus pictus, GRAY, Catal. Lizz. Brit. Mus. 1845, 213.

Eulaemus pictus, GRD. in Proc. Acad. Nat. Sci. Philad. November, 1857, 198.

OBSERV.—This species was not met with by the U. S. Exploring Expedition, and we regret not having had an opportunity to give a good figure of it, which would be so desirable.

LOC.—Republic of Chile.

4. EULAEMUS FITZINGERI, Grd.

SPEC. CHAR.—Head short; snout narrow and rounded. Temporal scales hexagonal, smooth. Auricular aperture subtubercular. Dorsal and lateral scales subequal, latter smooth; abdominal scales entire, lozenge-shaped on the chest, quadrangular on the belly. Posterior aspect of thighs granular, with a patch of scales near the tail. Greyish-brown or chestnut, or fawn-yellow above, with four series of black blotches, posteriorly white-margined; lips vertically marked with brown; limbs and tail with transverse angular bands, alternately dark chestnut and white; beneath white, the throat exhibiting brown, confluent lines. There are other varieties of coloration.

SYN.—*Proctotretus fitzingerii*, DUM. & BIBR. Erpét. gén. IV, 1837, 286.—GUICH. in *Gay*, Hist. de Chile, Zool. II, 1848, 38.

Ptychodeira fitzingeri, FITZ. Syst. Rept. I, 1843, 73.

Liolaemus fitzingeri, FITZ.

Liolaemus conspersus, GRAVENH. in Nov. Act. Acad. nat. cur. XVIII, ii, 1838, 735. Pl. LIV, fig. 14.

Eulaemus fitzingeri, GRD. in Proc. Acad. Nat. Sci. Philad. November, 1857, 198.

OBSERV.—We have no specimens of this species in our possession.

LOC.—Republic of Chile.

5. EULAEMUS AFFINIS, Grd.

SPEC. CHAR.—Head short; snout broad and rounded. Cephalic plates small and numerous. Temporal scales subhexagonal, smooth, rather convex, and but slightly imbricated. Auricular aperture oval, granular in front. Dorsal scales rather larger than the lateral ones, which are smooth; abdominal scales rhomboid, smooth. Posterior aspect of thighs granular, with a patch of scales near the tail.

SYN.—*Proctotretus fitzingerii*, BELL, Zool. Voy. Beagle, V, 1843, 11. Pl. v, fig. 1.
Liolaemus fitzingerii, GRAY, Catal. Lizz. Brit. Mus. 1845, 215.
Eulaemus affinis, GRD. in Proc. Acad. Nat. Sci. Philad. November, 1857, 198.

OBSERV.—Not amongst the reptiles collected by the U. S. Exploring Expedition. The study of its characters, in the published records, has convinced us that it was distinct from the Chilian species.

LOC.—Port Desiré and Santa Cruz, Patagonia.

6. EULAEMUS SIGNIFER, Grd.

SPEC. CHAR.—Head short, depressed; snout narrow and rounded. Supralabials smaller than the labials. Temporal scales moderate, imbricated, smooth; uppermost subcarinated. Auricular aperture rather small, subtubercular. Dorsal scales rhomboid; lateral scales smooth and larger; abdominal scales somewhat convex, generally entire posteriorly. Posterior aspect of thighs wholly granular. Greyish-fawn above, with four series of black, hieroglyphic spots along the neck and body, transversely angular on the tail, and lineated on the limbs; beneath white, with brown, small spots on the belly, and marmorated on the throat.

SYN.—*Proctotretus signifer*, DUM. & BIBR. Erpét. gén. IV, 1837, 288.—BELL, Voy. Zool. Beagle, V, 1843, 8. Pl. IV, fig. 1.—GUICH. in *Gay*, Hist. de Chile, Zool. II, 1848, 40.

Liolaemus hieroglyphicus, GRAVENH. in Nov. Act. Acad. nat. cur. XVIII, ii, 1838, 732.
Ptychodeira signifera, FITZ. Syst. Rept. I, 1843, 73.
Liolaemus signifer, GRAY, Catal. Lizz. Brit. Mus. 1845, 214.
Eulaemus signifer, GRD. in Proc. Acad. Nat. Sci. Philad. November, 1857, 198.

OBSERV.—Authors disagree as to the number of series of supralabial plates: the attention of future observers will have to be directed to this point. We had no specimens of this species at our command. The lateral scales are said to be larger than the dorsal ones: this statement likewise requires verification.

LOC.—Republic of Chile.

7. EULAEMUS MACULATUS, Grd.

SPEC. CHAR.—Head rather depressed. Auricular aperture tubercular in front. Supraciliary plates, five on either side, polygonal. Vertex plate rounded, with two well-developed parietals behind it. Dorsal scales small, rhomboid, disposed nearly in longitudinal series; scales on the flanks smaller than on the back, granular; abdominal scales small, smooth. Posterior aspect of thighs wholly granular. Olive, with cross series of black-edged white spots.

SYN.—*Liolaemus maculatus*, GRAY, Catal. Lizz. Brit. Mus. 1845, 214.
Tropidurus maculatus, GRAY, Brit. Mus. 1836.
Eulaemus maculatus, GRD. in Proc. Acad. Nat. Sci. Philad. November, 1857, 198.

OBSERV.—It is not without hesitation that we have placed the above species, established upon immature specimens, in the genus *Eulaemus*, owing to the incompleteness of the description given by its author, and the absence of specimens from the collections we have had access to. Future observers will have to bear this circumstance in mind.

LOC.—Republic of Peru.

Subgenus ORTHOLAEMUS, Girard.

Char. gen.—*Scutis cephalicis minoribus, non imbricatis, laevibus; supralabialibus in tres vel plures series dispositis. Naribus superioribus. Squamis temporalibus laevibus, non imbricatis. Apertura auditoria modica, simplici. Colli lateribus corrugatis, granulosis; plicatura praescapulari vertico-obliqua. Squamis dorsualibus parvibus, leviter carinatis, postice obtusis; lateralibus multo minoribus et granulosis; abdominalibus subrhomboideis vel sublanceolatis, integris vel subfimbriatis. Femorum facie posteriori vel omnino granulosa, vel aëra illius parva, caudam versus, squamis parvis tecta. Colore claro, nigro maculato, et interdum punctato.*

Gen. Char.—Cephalic plates rather small, not imbricated, smooth; three or more series of supralabials. Nostrils superior. Temporal scales smooth, not imbricated. Auricular aperture moderate, simple. Sides of the neck rumpled, granular. A vertico-oblique fold in advance of the shoulder. Dorsal scales small, slightly carinated, posteriorly obtuse; lateral scales a good deal smaller, subgranular; abdominal scales subrhomboid or sublanceolated, entire or subfimbriated. Thighs either wholly granular, or with a patch of small scales near the tail. Dark-spotted, upon a light ground, and occasionally speckled also.

Syn.—*Ortholaemus*, Grd. in Proc. Acad. Nat. Sci. Philad. November, 1857, 198.

Observ.—The dorsal scales present the same general aspect and structure as in *Eulaemus*, but the lateral ones are much smaller, assuming quite a granular character. The abdominal scales, on the other hand, are subrhomboid or sublanceolated, rather acuminated, with a proclivity of their posterior edge to being fimbriated. The temporal scales are smooth, and not imbricated, and the supralabial plates constitute always more than one series. The auricular aperture is simple. The pattern of coloration is also very peculiar: there are neither longitudinal streaks nor transverse bands; upon a uniform rather light ground, varying in shade according to species, dark spots are irregularly distributed; sometimes interspersed with brighter specks.

1. Ortholaemus beaglii, Grd.

(Plate XVII, figs. 15–21.)

Char. spec.—*Capite breve, depresso, cuneato; rostro obtuso. Scutis supralabialibus in tres series dispositis, quam superlabiales majoribus; infralabialibus in tres series dispositis. Scutis mentalibus parvis, in septem vel octo paria ordinatis. Squamis temporalibus parvibus, subconvexibus. Apertura auditoria modica. Squamis dorsualibus quam abdominales minoribus; abdominalibus subrhomboideis, paulo acuminatis, subfimbriatis. Femorum facie posteriori granulosa; aëra illius parva, caudam versus, squamis parvis tecta. Supra fusco-olivaceo, nigro maculato. Macula atra humerali. Infra flavo-albescente, unicolori.*

Spec. Char.—Head short, depressed, wedge-shaped; snout rounded. Three series of supralabials, smaller than the upper labials. Lower labials larger than the upper labials; three series of infralabials. Seven or eight pairs of small mental shields. Temporal scales small and subconvex. Auricular aperture moderate. Dorsal scales smaller than the abdominal ones, which are subrhomboid, rather acuminated, and subfimbriated. Upper part of flanks subgranular. Posterior aspect of thighs granular, with a patch of small scales near the tail. Olive-brown above, maculated with black. A jet-black humeral spot. Beneath whitish-yellow, unicolor.

Syn.—*Proctotretus multimaculatus*, Bell, Zool. Voy. Beagle, V, 1843, 17. Pl. ix, fig. 1.—Gray, Catal. Lizz. Brit. Mus. 1845, 217.

Ortholaemus beaglii, Grd. in Proc. Acad. Nat. Sci. Philad. November, 1857, 198.

Descr.—In its general aspect, the species here referred to is thick and short. The body is depressed, wider than deep, and, as usual, thicker upon its middle region. A contracted neck separates the body from the head. The latter is plane upon the occipital region, convex above the eyes, hence, very declivous forwards. The snout, consequently, is wedge-shaped, with both jaws equal. The cleft of the mouth is subconcave in advance of the eye; its angle is nearly horizontal, with a tendency of being depressed. The limbs are slender:

when the anterior pair is extended backwards alongside the body, the extremity of the longest finger is far from reaching the groin; whilst the posterior pair, in being stretched forwards, sends the tip of its longest toe to the axilla.

The cephalic plates are, generally speaking, quite small and smooth; they are somewhat more developed upon the frontal region than elsewhere, and irregularly arranged. Those occupying the supraocular region are likewise more conspicuous than the occipital ones, and sometimes disposed upon a curve, contiguous to the vertex region. The nostrils, which open at the posterior margin of a subelliptical plate, the largest of the cephalic group, are situated on the upper surface of the snout, within the supraciliary ridge, and much nearer to the tip of the snout than to the anterior rim of the orbit. The supraciliary ridge is composed of very small and thin plates immediately above the eye, and larger in advance of these organs; it may be traced to the inferior edge of the nasal plate. The rostral is rather small, depressed, and subconvex superiorly. A series of four small plates may be observed along the upper edge of the rostral, thus separating entirely the latter from the nasals and frontals. There are eight upper labials: the anterior three being the smallest; the others, nearly equal-sized, are longer than high. The loral region is covered with small and irregular plates, three series of which may be traced beneath the orbit, as supralabials. There are three suborbitals: the middle one very long, and subconvex; the anterior and posterior ones quite small. The margin of the eyelid is provided with a double series of plates, those constituting the inner series being subquadrangular, whilst in the outer series, they assume a subconical aspect. The surface of the eyelid itself is granular. The plates of the infero-posterior portion of the temporal region are somewhat larger than the antero-superior. The symphyseal plate is well developed, subhexagonal in shape, narrower anteriorly than posteriorly. We observe also eight lower labials, but they are all nearly equal-sized, being subquadrilateral, a little longer than high. There is a series of seven or eight well-developed mental shields, diminishing in size posteriorly. Three series of small and irregular scales may be observed between the latter and the labials. The throat is covered with subrhomboid scales, somewhat smaller than on the abdomen. The neck is smooth beneath, and wrinkled laterally. The wrinkles are meandriform, and, by a mistake, were not represented on Figure 8. The entire surface occupied

by these wrinkles is finely granular. The auricular aperture is vertically subelliptical, of moderate development, and not overlapped by any scales; its circumference being wholly granular.

The scales are small, subrhomboid, and slightly carinated; they are the smallest upon the neck, increasing somewhat along the back to the posterior portion of the body, where they are the largest, passing gradually to the caudal scales, which are larger still, and disposed upon verticils. The keels here become more apparent, and the scales, from rhomboid, assume a subtrapezoid aspect, with an oblique direction of the keels. Two granular areas may be seen pointing towards the middle of the flanks, proceeding, one from the axilla, the other from the groin. The middle portion of the flank is covered with smooth scales, similar to those on the abdomen, but lanceolated in shape, instead of being subrhomboid, as are all those extending from the chest to the insertion of the hind limbs. On the preanal region, the scales are smaller than on the abdomen; they are very small, almost granular at the periphery of the vent; upon the inferior surface of the tail, they have the same general aspect as on the upper surface, with the exception, that they are smooth, instead of being carinated. The upper surface of the fore-limbs is covered with carinated scales, similar to those of the back, whilst on their anterior aspect, they are more strongly carinated and lanceolated. The postero inferior aspect of the forearm is granular; that of the arm is covered with small and smooth scales. The fingers are slender and scaly to the base of the nails; there are three series of scales upon their upper aspects, two of which might be considered as lateral series, and two beneath, not in verticils; they are, moreover, smooth. The inner finger is quite small; the outer one or fifth is the next in size; the second comes next; the third and fourth are much longer than the rest, the fourth being the longest of all. The palm of the hand is granular. The nails are slender, compressed at the base, acute upon their extremities, and slightly curved. The upper aspect of the hind limbs is likewise covered with scales, similar to those of the posterior portion of the back, though somewhat larger, and more conspicuously carinated. On the anterior aspect of the thigh, the scales are rather large, nearly smooth, and posteriorly acute. The posterior aspect of the same region is granular. The inferior surface of the thigh and leg is covered with smooth and small scales, as also the posterior aspect of the leg. The soles of the feet are granular. The toes are slender,

covered with scales similar to those of the fingers: the inner or first toe is the smallest; the second is the next in length; the third and fifth are nearly equal sized, whilst the fourth is the longest.

The upper regions are olive-brown, interspersed with numerous small, black, and irregular spots, extending equally to the upper surface and sides of the head, and over the limbs to the very tip of the fingers and toes. A subcircular, jet-black spot, may be observed at the shoulders. The inferior regions are generally unicolor, of a whitish-yellow hue; sometimes small, blackish spots, may be seen under the neck and abdomen.

Loc.—Specimens of this species were collected among the sandhills, on the coast of Patagonia, where they abound. A sketch of the coloration, from life, was made at that place by Mr. Drayton.

Plate XVII, fig. 15, represents *Ortholaemus beaglii*, in profile and of the size of life.

Fig. 16, is an inferior view of the same animal.

Fig. 17, an upper view of the head;

Fig. 18, a front view of the same.

Fig. 19, the left hand, from above.

Fig. 20, a group of dorsal scales;

Fig. 21, a group of abdominal scales.

Figs. 17–21, are somewhat magnified.

2. Ortholaemus multimaculatus, Grd.

Spec. Char.—Head short, depressed; snout truncated and rounded. Four series of supralabials, nearly equal to the labials. Temporal scales large, lozenge-shaped, imbricated. Auricular aperture quite small. Dorsal scales rhomboid; lateral scales smaller and smooth; abdominal scales rhomboid and entire. Posterior aspect of thighs wholly granular. Grey above, with numerous small and crowded black spots; beneath white. Nails entirely white.

Syn.—*Proctotretus multimaculatus*, Dum. & Bibr. Erpét. gén. IV, 1837, 290.—Guich. in *Gay*, Hist. de Chile, Zool. II, 1848, 42.

Liolaemus (Liodeira) multimaculatus, Fitz. Syst. Rept. I, 1843, 74.

Ortholaemus multimaculatus, Grd. in Proc. Acad. Nat. Sci. Philad. November, 1857, 198.

OBSERV.—This species, which, at first sight, resembles so closely the preceding one, is, nevertheless, easily distinguished from it, so soon as the differences are once pointed out.

LOC.—Republic of Chile.

3. ORTHOLAEMUS FITZROII, Grd.

SPEC. CHAR.—Head rather short; snout obtuse, subrounded. Cephalic plates small and numerous. Two series of supralabials. Auricular aperture moderate-sized, with minute granular scales in front. Temporal scales small, flat, and smooth. Dorsal scales moderate; lateral scales smaller; abdominal scales smooth and polished, emarginated upon the sides of the throat and under aspect of the neck. Posterior aspect of thighs granular, with a patch of scales near the tail. Ash-grey, with dark brown marks and specks of orange and blue. Gorge orange-colored, with faint stripes of blue.

SYN.—*Proctotretus wiegmannii*, BELL, Zool. Voy. Beagle, V, 1843, 15. Pl. VIII, figs. 1–2.
Liolaemus wiegmannii, GRAY, Catal. Lizz. Brit. Mus. 1845, 216.
Ortholaemus fitzroii, GRD. in Proc. Acad. Nat. Sci. Philad. November, 1857, 198.

OBSERV.—This species, identified by Thos. Bell with *Proctotretus wiegmanni*, of the French herpetologists, does not even belong to the same subgeneric division. It is equally distinct from the preceding two species, its true congeners.

LOC.—Bahia Blanca and Rio Negro, Patagonia; and Maldonado, near the mouth of the Rio La Plata.

GENUS BRACHYLOPHUS, CUV.

GEN. CHAR.—A slight hanging longitudinal fold under the throat. A transverse fold across the chest to the shoulders. Cephalic plates small, polygonal, smooth, and nearly equal. Tympanum near the outer edge of the auricular aperture. Teeth upon the palatine bones.

Maxillary teeth compressed and tricuspid. Dorsal scales granular. A low crest all along the back. Abdominal scales plate-like. A series of femoral pores in the male. Tail very long and slender, compressed at its base, and rounded upon the rest of its length.

Syn.—*Brachylophus*, Cuv. Règn. Anim. 2d ed. II, 1829, 41.—Wagl. Naturl. Syst. Amph. 1830, 151.—Gray, Synops. Rept. in *Griff.* Anim. Kingd. IX, 1831, 37.—Wiegm. Herp. Mex. I, 1834, 16.—Dum. & Bibr. Erpét. gén. IV, 1837, 225.—Fitz. Syst. Rept. I, 1843, 55.—Gray, Catal. Lizz. Brit. Mus. 1845, 187.—Dum. & A. Dum. Catal. méth. Rept. Mus. d'hist. nat. i, 1851, 64.

Observ.—This is one of the most interesting genera of the Saurian Order, composed so far of but one well-determined species, the geographic distribution of which appears to be rather wide, since it is spoken of as occurring in the East Indies, and in some islands of New Guinea. The Exploring Expedition met with it at Tongataboo, and at the Feejees. These are the only specimens we ever had an opportunity to examine. It would have given us great satisfaction had we been enabled to compare them with specimens collected in the East Indies. We cannot help entertaining some doubts as to the specific identity of all of them. We notice a marked difference in the extension of the dorsal crest along the tail, between the descriptions referred to in the synonymy and the specimens which we have examined, and also in the number of the femoral pores. These differences may prove of no account, but we should like to see the investigations carried a little further, and a thorough comparison instituted between specimens of these remote localities.

Brachylophus fasciatus, Cuv.

(Plate XVIII, figs. 8 & 9.)

Spec. Char.—Color either entirely green, of a darker shade along the back than on the belly, or else irregular bands or fasciae of a bright green or sky-blue, may be observed upon a dull green or bluish-brown ground.

Syn.—*Iguana fasciata*, Brongn. Bull. Soc. Philom. 1800, 90. Tab. vi, fig. 1; &, Ess. Class. Rept. 1805, 34. Pl. I, fig. 5.—Latr. Hist. nat. Rept. I, 1802, 275.

—Daud. Hist. nat. Rept. III, 1805, 352.—Merr. Tent. Syst. Amph. 1820, 48.—Griff. Anim. Kingd. IX, 1831, 39.

Brachylophus fasciatus, Cuv. Règn. Anim. 2d ed. II, 1829, 41.—Guer. Iconogr. du Règn. Anim. Rept. 1833. Pl. ix, fig. 1.—Wagl. Naturl. Syst. Amph. 1830, 151.—Gray, Synops. Rept. in *Griff.* Anim. Kingd. IX, 1831, 37.—Wiegm. Herp. Mexic. I, 1834, 16.—Dum. & Bibr. Erpét. gén. IV, 1837, 226.—Fitz. Syst. Rept. I, 1843, 55.—Gray, Catal. Lizz. Brit. Mus. 1845, 187.—Dum. & A. Dum. Catal. méth. Rept. Mus. d'hist. nat. I, 1851, 64.

Ctenosaurus sieberi, Fitz.

Observ.—The specimens preserved are dried skins, having lost, in a great measure, their natural shape, especially the head, neck, and limbs. The general aspect of the animal, however, is admirably given in the accompanying figure, made from life at the time the specimens were collected. The soft parts of the inside of the mouth, together with the palatine teeth, are entirely removed, the maxillary teeth being the only organs left; they are largest posteriorly than upon the symphyses of the jaws.

Descr.—The upper surface and sides of the head are protected by small, nearly equal, and smooth polygonal plates: the occipital being but a trifle larger than the rest, and depressed upon its centre. Those occupying the extremity of the snout, in the immediate neighborhood of the rostral, as well as the phrenic region, are also somewhat larger than upon the frontal region. As to the nostrils, they perforate one plate, situated above the first labial. The lower labials are more conspicuous than the upper; three series of elongated plates may be observed under the branches of the dentary, in contiguity with the labials. Otherwise, the scales upon the inferior surface of the head are quite small. Over the auricular aperture, and near the surface, is stretched the tympanum, subcircular or elliptical in shape, obliquely situated behind the angle of the mouth.

The body is compressed, deeper than broad, and tapering posteriorly, being nearly as thick at the shoulders as on the middle of its length. A small crest may be observed along the dorsal line, extending from the occipital region to beyond the anterior third of the tail, most conspicuous upon the neck and opposite the shoulders, diminishing posteriorly, and gradually vanishing away amongst the keeled scales of the posterior half of the tail. A fold of the skin is placed longitudinally along the throat; another along the sides of the neck, and

another still across the chest, in advance of the shoulders. The scales of the dorsal and lateral regions are small, assuming somewhat a granular aspect, especially upon the neck, where they are smaller than on the trunk, where they are disposed upon transverse series; they are nearly equal, mayhap, slightly increasing in size on the sides, which they really do as they approximate the abdominal region. On the tail and upper surface of the limbs, the scales are a good deal larger, appear to be imbricated, and conspicuously carinated, except upon the anterior third of the tail, where the carination is scarcely perceptible, and where their arrangement upon annular series is yet quite apparent. Upon the middle region of the abdomen, from the chest to the insertion of the thighs, the scales are but slightly carinated, their shape being subquadrangular, elongated, and arranged upon transverse series; upon the chest and gular region, they are subrhomboid, posteriorly acute, smaller than on the abdomen, and conspicuously carinated; under the anterior legs, they are a good deal smaller than on the chest, less acute posteriorly, and not quite so strongly carinated; under the hind limbs, they resemble the former, though larger; and, along the leg proper, they are larger than along the thigh, where, in the male, sixteen femoral pores may be seen, the series from either side not being continuous upon the interfemoral region, where a wide separation exists. Under the palm of the hands, the scales are minute or granular; under the sole of the feet, small, but distinct; in both instances, carinated. Under the fingers and toes may be observed transverse, multicarinated plates. The second and third fingers and toes are, moreover, provided, upon their external margin, with a serrated, horny, scale-like expansion. The nails are strong, compressed, curved, and acerated. Under the tail, the scales are the largest of all, elongated, arranged upon transverse series, strongly carinated, the carination constituting several longitudinal ridges.

The color of some specimens is of a uniform green, of a somewhat darker shade along the back than on the belly, where a yellowish hue predominates. This uniform tint extends to a portion of the tail: the remainder of that organ being annulated alternately brown and blackish. Other specimens present a ground of a dull verdigris, with transverse bands or fasciae of a bright green hue. One of these bands is situated across the shoulders, wide above, and diminishing towards the insertion of the arms, sending forwards a branch along the neck

to connect with an occipital and cephalic patch just behind the tympanum. A second band occupies the middle of the trunk, diminishing also towards the abdomen. A third band is seen upon the posterior extremity of the trunk, extending to the groins. These bands do not extend to the inferior surface of the body. Upon the anterior third of the tail, there are five transverse half-rings, of a bright green, varying in width, as well as the intermediate spaces. The rest of the tail is annulated, as in the variety just described.

Loc.—Tongataboo and Feejee Islands, where they are said to be quite common. Both varieties of coloration having been observed on the latter islands.

While at the Feejees, Dr. Pickering remarked: "Several specimens were brought me by the natives, and some were kept alive in my room for several days. They seemed to be of an indolent and gentle disposition, never attempting to bite. They are said to keep about the Banana plants."

Plate XVIII, fig. 8, represents, size of life, the banded variety, from a specimen caught on the Feejee Islands, in May, 1840.

Fig. 9, exhibits the outline of a few teeth, somewhat magnified, in order to show their peculiar form.

Genus SCELOPORUS, Wiegm.

Gen. Char.—Head rather short and depressed, with its anterior outline obtuse and rounded. Cephalic plates moderate, polygonal, and smooth; the occipital larger than the rest. No teeth on the palate. Tongue thick and fleshy, anteriorly emarginated, or bifid. Auricular aperture moderate, oblique, anteriorly denticulated; tympanum rather sunk. Temporal scales keeled. Neck underneath smooth, provided laterally with an oblique fold. Body rather short and depressed, without dorsal crest; covered with imbricated, carinated, and acuminated scales on the back, smooth, though often posteriorly emarginated on the belly. Limbs well developed; five fingers and five toes, unequal, slender, compressed, clawed. Femoral pores in both sexes; no preanal pores. Tail depressed at the base, sub-

conical and tapering posteriorly, not crested, covered with subverticillated and keeled scales.

Syn.—*Sceloporus*, Wiegm. in *Oken*, Isis, XXI, 1828, 369; &, Herp. Mex. I, 1834, 18 & 48.—Fitz. Syst. Rept. I, 1843, 75.—Gray, Catal. Lizz. Brit. Mus. 1845, 209.—B. & G. in *Marcy's* Expl. Red Riv. of La. 1853, 236.

Tropidolepis (in part), Cuv. Règn. Anim. 2d ed. II, 1829, 38.—Gray, Synops. Rept. in *Griff.* Anim. Kingd. IX, 1831, 42; &, Catal. Lizz. Brit. Mus. 1845, 180 & 208.—Dum. & Bibr. Erpét. gén. IV, 1837, 294.—Holbr. N. Amer. Herp. II, 1842, 73.—Dum. & A. Dum. Catal. méth. Rept. Mus. d'hist. nat. I, 1851, 76.

Observ.—This genus, a very natural one in its family, may be distinguished from *Proctotretus*, and congeners, by the absence of palatine teeth, and of preanal pores also; by the presence of femoral pores, and a fold of the skin, obliquely situated on the sides of the neck, overlying a well-marked concavity.

The head is short, depressed, subtriangular in its outline, and obtusely rounded upon the snout. The most conspicuous of the cephalic plates are an odd occipital, a vertex plate, some frontals, and a series of supraoculars.

The tongue is obtuse, and slightly notched anteriorly; its surface being covered with villous papillae. The teeth are short, and almost uniform in size; the anterior ones being simply conical, whilst they are tricuspid on the sides of the jaws. The nostrils are situated near the apex of the snout, perforating each one single plate, surrounded by three or four small scales. The neck is slightly contracted; the lateral concavity, under the fold, is lined with small, granular scales. The anterior edge of the auricular aperture exhibits a serrated appearance, owing to the presence thereon of a few subtriangular scales; the tympanum is situated somewhat below the surface. The sides of the neck are covered with small scales, similar in shape and structure to those of the back and sides of the body. The body is rather short and depressed. The tail is depressed at the base, and conical posteriorly. The scales which cover the upper regions are, generally speaking, well developed, imbricated, keeled, and acuminated. The abdominal scales are smooth, smaller than the dorsal ones, and oftentimes notched, acerated, bifid, or multifid.

The limbs are proportionally well developed, and in harmony with the size of the body. A series from twelve to sixteen femoral pores may be observed on each side, the posterior aspect of the thighs being minutely scaly.

The male sex is to be distinguished from the female by two rather large, concave plates, or scutellae, situated immediately behind the external opening of the cloaca.

1. Sceloporus undulatus, Wiegm.

(Plate XIX, figs. 15–21.)

Spec. Char.—Parietal plate smaller than the vertex plate. Two or three unequal lorals. Temporal scales moderate, obtuse. Upper labials exiguous; two series of supralabials, the uppermost largest, irregular, elongated, the inferior ones being still more exiguous than the upper labials themselves. Lower labials somewhat larger than the upper; infralabials smaller than the lower labials, and disposed upon one series and a half. Preanal scales small, posteriorly acuminated, or emarginated. Postanal scales moderate, keeled, acuminated. Posterior aspect of the thighs covered with blunt, keeled, very small scales.

Syn.—*Lacerta undulata*, Bosc. MSS.

Stellio undulatus, Latr. Hist. nat. Rept. II, 1802, 40.

Agama undulata, Daud. Hist. nat. Rept. III, 1805, 384.—Habl. Journ. Acad. Nat. Sci. Philad. VI, 1829, 13.

Uromastix undulatus, Merr. Tent. Syst. Amph. 1820, 57.

Lacerta hyacinthina, Green, Journ. Acad. Nat. Sci. Philad. I, 1818, 349 & 405 (male).

Lacerta fasciata, Green, Journ. Acad. Nat. Sci. Philad. I, 1818, 349 & 406 (female).

Tropidolepis undulatus, Cuv. Règn. Anim. 2d ed. II, 1829, 38.—Gray, Synops. Rept. in *Griff.* Anim. Kingd. IX, 1831, 43; &, Catal. Lizz. Brit. Mus. 1845, 208.—Dum. & Bibr. Erpét. gén. IV, 1837, 298.—Holbr. N. Amer. Herp. III, 1838, 51. Pl. viii; &, 2d ed. II, 1842, 73, Pl. ix.—Dum. & A. Dum. Catal. méth. Rept. Mus. d'hist. nat. i, 1851, 76.

Sceloporus undulatus, Wiegm. in *Oken*, Isis, 1828, 369; &, Herp. Mex. i, 1834, 48.—Fitz. Syst. Rept. i, 1843, 75.

Descr.—The head is depressed; the snout very obtuse, and the interocular region very slightly convex, declivous from the frontal region to the apex of the snout. The rostral plate is subtriangular, quite developed transversely, and rather low. The nostrils are circular, perforating a small plate, separated from the rostral by a still smaller plate, situated immediately in advance and inwardly of the

supraciliary ridge. As many as ten, mayhap twelve, quite small plates may be observed upon the internasal region. There are eight frontal plates, grouped around a ninth, larger one. The vertex plate (interocular of some authors), is transversely divided posterior to the middle of its length. Its general form is obtusely hexagonal, much broader anteriorly than posteriorly. The occipital is the largest of the cephalic plates; it is rounded behind, angular in front, and having, on each side, a series of three conspicuous plates, the foremost of which being in contact with the vertex plate. There are but six transversely dilated supraoculars, forming a semi-crescentic series, at the concavity of which are to be observed four or five quite small plates. A series of five very small plates exist between the latter and the occipitals, extending from the vertex plate towards the posterior rim of the orbit. Two other small supraoculars may be observed alongside the frontals. The supraciliary ridge is conspicuously developed, and composed of six plates, the three posterior of which being elongated and imbricated. The labial plates are quadrangular or pentagonal, elongated, very narrow, five or six on either side, on the upper as well as lower jaws. There are two series of supralabials, somewhat smaller than the labials, whilst one series only of infralabials is observed. The mental shields, four in number, on either side, are of moderate development, diminishing gradually in size posteriorly. The symphyseal plate is as large as the anterior mental shield.

The auricular aperture is large, ovate, and oblique, provided, upon its anterior margin, with rather elongated scales, giving it a serrated appearance. The temporal scales are rather broader than long, slightly keeled, and obtuse posteriorly, the keels not stretching beyond their margin. The fold of the neck overhangs a rather deep cavity, interiorly lined with very minute scales, whilst very prominent ones may be observed upon the outer aspect of that fold.

The neck and the body, both, are quite depressed; the back, however, is slightly convex, whilst the belly is flat.

The tail is generally one-third or one-fourth longer than the body and head combined, thick, broad, and depressed at the base; it is, on the other hand, slender and conical posteriorly, and tapering into a point.

The fore-limbs, when bent backwards alongside the body, do not reach the groins, whilst the hind ones, directed forwards, will extend as far as the auricular aperture.

The scales are comparatively well developed, larger on the back than on the sides; all of them, those on the neck as well as on the body and limbs, being rhomboid; they are imbricated, keeled, posteriorly acuminated by the extension of the keels. Those of the dorsal region are entire upon their margin, and disposed upon ten or eleven longitudinal series; whilst on the sides, they are more or less denticulated or serrated: their free margin being, at all events, provided with three points, a middle one, which is the largest, and one on each side. The upper caudal scales are subquadrangular, somewhat oblong, provided, in the direction of their length, with an oblique keel, which terminates in a rather strong point. The inferior caudal scales, which are likewise carinated and acuminated, resemble in shape an isoceles triangle all along the conical and slender portion of the tail; whilst under its base and thickened portion, they assume a rhombic form, having their margin serrated in the manner already alluded to.

The throat is covered with rather large and rhomboid, very thin, smooth, imbricated, and posteriorly notched scales, except over the chin and sides of the jaws, where they are considerably smaller; on the pectoral and abdominal regions, they are equally smooth, though somewhat larger, and posteriorly tricuspid; under the limbs, they are rhomboid, keeled, provided posteriorly with two or three small needles. The fingers and toes are covered above and sideways with small, rhomboid, and slightly keeled scales, whilst the lower surface is protected with broad, quadrangular, and tricarinated plates.

There are about fourteen conspicuous femoral pores on either side, perforating the posterior portion of a quadrangular shield.

The ground color of the upper regions, in either sex, may be of a greenish-grey, bronze, or coppery hue, generally unicolor in the male, and transverse, undulating, blackish bands in the female. These bands are either continuous or interrupted upon their middle, and bordered posteriorly with fawn, yellowish, or whitish. The upper surface of the head exhibits three transverse black streaks: one across the frontal region, another across the orbital region, and the third along the posterior edge of the occipital plates. The upper surface of the limbs is barred with blackish to the very tip of the fingers. A black streak often extends from the orbit across the temporal region and auricular aperture, along the neck to the shoulder. The axillar and inguinal regions, and the sides of the abdomen also, are dotted with black, or

else variegated with sinuous black lines. The inferior regions are whitish in the young, and dull yellowish in the adult, spotted or streaked with black. On the sides of the throat, there is a bluish spot, margined with black.

In the male, the throat is black, with a blue spot on each side, sometimes confluent, forming a collar. The chin may be entirely black or else whitish. The neck, from the pit to the shoulder, and likewise the anterior portion of the forearm, may be black also. The pectoral region is whitish or yellowish, together with the middle of the abdomen, the sides of which are blue, the periphery of the blue patch being margined with black. Sometimes, the sides of the abdomen and the anterior portion of the thighs are likewise black. The inferior surface of the limbs exhibits the same hue as the middle of the abdomen : whitish or yellowish, with a shade of blackish.

Loc.—This species inhabits the country lying between the Mississippi Valley and the Atlantic Ocean, New Jersey, and the Gulf of Mexico. Though not amongst those collected by the U. S. Exploring Expedition, a description and figures of the same were imperatively demanded, since some specimens, brought home from the western coast of America, belong to a species so closely related to it, that it would have proved an ungrateful task to attempt describing the one without the other.

Plate XIX, fig. 15, represents, in profile, the male sex of *Sceloporus undulatus*, size of life.

Fig. 16, is an under view of the same individual.

Fig. 17, the head, viewed from above ;

Fig. 18, a front view of the head.

Fig. 19, the left hand, seen from above.

Fig. 20, exhibits a group of dorsal scales ;

Fig. 21, a group of abdominal scales.

Figs. 17–21, are somewhat magnified, in order to show, more distinctly, the structures they are intended to represent.

2. Sceloporus occidentalis, B. & G.

(Plate XIX, figs. 8–14.)

Char. spec.—*Scutis cephalicis rugosis; scuto anteparietali scuto verticis fere aequali; loreali uno vel duobus, subaequalibus. Squamis temporalibus minimis, carinatis, acuminatis; praeanalibus modicis, postice rotundis, subemarginatis; postanalibus minimis, laevibus, subtruncatis, subemarginatis. Femorum facie posteriori squamis minutissimis, lanceolatis, et carinatis, coöperta. Corpore supra fusco, cum dorsuali et laterali serie macularum nigrarum et postice albo marginatarum, quae series vittâ clarâ, interdum interruptâ, separantur.*

Spec. Char.—Cephalic plates rugose; anterior parietal nearly equal to the vertex plate. One or two unequal lorals. Temporal scales small, keeled, and acuminated. Preanal scales moderate, posteriorly rounded, subemarginated; postanals small, smooth, subtruncated, subemarginated. Posterior aspect of thighs covered with minute, lanceolated, and keeled scales. Coloration: various shades of brown above, with a dorsal and a lateral series of black, posteriorly white-edged spots, separated by a light, sometimes interrupted, streak.

Syn.—*Sceloporus occidentalis*, B. & G. in Proc. Acad. Nat. Sci. Philad. VI, 1852, 175.

Descr.—The general form and proportions of the body and limbs are pretty much the same as in *S. undulatus*. The head, however, is more depressed. Differences in the cephalic plates are made apparent by figs. 10 & 17, of Plate xix. Without dwelling too much upon the vertex and occipital plates, which we have found varying within certain proportions, we will allude more particularly to the supraoculars, which are not subjected to any variations, as far, at least, as our observations of the latter extend. We notice two subcrescentic series of them, the outermost being composed of very small and narrow plates, longer than broad, whilst the other series consists of six transversely dilated and quite large plates, hence, broader than long. Between the latter and the supraciliary ridge, there are two more parallel series of small plates. The mental shields constitute a longer series

than in *S. undulatus*, though, in their general form and disposition, they are alike.

The most prominent difference, however, between the present species and *S. undulatus*, consists in the scales, both dorsal and abdominal, and which are a good deal larger, as exhibited by figs. 13 & 20. The dorsal ones are more conspicuously keeled, giving to the animal a much rougher appearance, whilst on the abdomen, they are not quite so deeply notched or pointed, making them to appear smoother. The scales under the hind limbs are but very slightly keeled, if at all, except on the sole of the feet, which again appear very rough. The two large postanal shields, that may be seen on fig. 9, and which are a characteristic of the male sex, when compared to those in figs. 2 & 16, of the same plate, will show corresponding differences.

The coloration we will not attempt to describe from the specimens preserved in alcohol. Judging of it by the faint traces that may still be observed, it must have been very similar in its pattern to that of *S. undulatus*. The blue abdominal patches are wider apart.

Loc.—California and Oregon, west of the Rocky Mountains.

Plate XIX, fig. 8, represents the profile of the male sex of *Sceloporus occidentalis*, size of life.

Fig. 9, is an under view of the same individual.

Fig. 10, the head, viewed from above;

Fig. 11, a front view of the head.

Fig. 12, the right hand, seen from above.

Fig. 13, a group of dorsal scales;

Fig. 14, a group of abdominal scales.

Figs. 10–14, being somewhat magnified, for the purpose of representing more distinctly all these parts.

3. Sceloporus frontalis, B. & G.

(Plate XIX, figs. 1–7.)

Char. spec.—*Scuto verticis quam anteparietalem majori; scutis postparietalibus in dua paria ordinatis, quam anteparietalem minoribus, pare anteriori majori. Latero-occipitalium pare uno. Scuto occipitali*

mediano, modico, subheptagonali; loreo uno. Scutis supralabialibus et infralabialibus in unam et dimidiam seriei partem ordinatis. Scutis mentalibus in quinque paria dispositis. Squamis postanalibus modicis, rotundis, leviter carinatis. Femorum facie posteriori squamis parvis, acutis, et carinatis, coöperta. Supra cinereo-caerulescente; abdominis lateribus nigro-caerulescentibus; regione mediana flavescente vel albescente.

SPEC. CHAR.—Vertex plate larger than the anterior parietal; two pairs of postparietals, smaller than the anterior parietal: foremost pair largest of the two. One pair of latero-occipitals. Middle occipital moderate, obtusely heptagonal. One loral plate. One, and a part of another, series of supralabials; one and a half series of infralabials. Mental shields in five pairs. Postanal scales moderate, rounded, slightly keeled. Posterior aspect of thighs covered with small, acute, and keeled scales. Bluish-grey above; abdomen bluish-black on the sides, yellowish or whitish upon its middle region.

SYN.—*Sceloporus frontalis*, B. & G. in Proc. Acad. Nat. Sci. Philad. VI, 1852, 175.

DESCR.—The most prominent specific character which distinguishes this species from the preceding ones, consists in the convexity of the frontal region, and, as a consequence, in the bluntness of the snout. The cephalic plates, in their shape and disposition, partake of both *S. undulatus* and *S. occidentalis:* the vertex plate resembles that of the former, and the supraoculars those of the latter. Again, the mental shields recall to mind the same parts in *S. undulatus.* The scales are smaller than in *S. occidentalis*, and the dorsal ones are not so quadrangular than in either of the species just alluded to, though provided with conspicuous keels. The abdominal scales are slightly notched upon their posterior margin, instead of being tricuspid, as in *S. undulatus.* The scales under the hind limbs are smooth, as in *S. occidentalis:* those on the sole of the feet being likewise keeled.

The color is but imperfectly preserved: the upper regions exhibit a bluish-grey or slate hue; the sides of the abdomen are bluish-black, whilst its middle region is yellowish or whitish, as well as the inferior surface of the limbs. The throat is bluish-black.

Loc.—This species was collected about Puget Sound, Oregon.

Plate XIX, fig. 1, represents a profile view of the male sex of *Sceloporus frontalis*, size of life.

Fig. 2, is an under view of the same individual.

Fig. 3, the head, seen from above;

Fig. 4, a front view of the head.

Fig. 5, the left hand, viewed from above.

Fig. 6, a group of dorsal scales;

Fig. 7, a group of abdominal scales.

Figs. 3–7, are somewhat magnified, to bring out the details more conspicuously.

4. Sceloporus gracilis, B. & G.

(Plate XX, figs. 1–9.)

Char. spec.—*Scutis cephalicis laevibus. Scuto anteparietali quam verticis majori; scutis postparietalibus in dua paria ordinatis. Scuto occipitali mediano amplissimo, pentagonali. Scutis latero-occipitalibus minimis, in dua paria dispositis; loreis duobus; supralabialibus in duplicem seriem ordinatis; mentalium quatuor paribus. Squamis postanalibus magnis, sublanceolatis, laevibus, postice emarginatis. Femorum facie posteriori squamis minimis, rotundis, et laevibus, coöperta. Supra fusco-olivaceo, cum duabus seriebus macularum nigrarum crescentiformibus, et duabus vittis claris in lateribus, inter quas punctorum nigrorum series invenitur. Infra flavescente; facie inferiori capitis caeruleo nebulata. Mare macula caerulea elongata in utroque abdominis latere notato.*

Spec. Char.—Cephalic plates smooth. Anterior parietal larger than the vertex plate; two pairs of postparietals. Middle occipital very large, pentagonal. Two pairs of small latero-occipitals. Two lorals. Two series of supralabials. Four pairs of mental shields. Postanal scales large, sublanceolated, smooth, posteriorly notched. Posterior aspect of thighs covered with small, rounded, and smooth scales. Olivaceous-brown above, with a double series of crescent-shaped black spots on the back, and two lateral light streaks, in the intervening

space of which is a series of black spots. Beneath yellowish; under surface of head clouded with bluish. Male provided with an elongated blue patch on each side of the abdomen.

SYN.—*Sceloporus gracilis*, B. & G. in Proc. Acad. Nat. Sci. Philad. VI, 1852, 175.

DESCR.—We have before us a slender and quite graceful species, the snout of which being proportionally more elongated than in any of the species above referred to. The occipital plate is almost subtriangular, being acute anteriorly, and rounded off posteriorly. The vertex plate, transversely subdivided through the middle of its length, is quite narrow posteriorly. The postfrontals are contiguous upon a greater surface than in the other species here described: hence, the vertex plate is more isolated from the middle frontal. The supraoculars are similar, in shape and development, to those of *S. occidentalis* and *S. frontalis*, with this difference, however, that the external subcrescentic series is composed of plates a good deal larger. The internal parallel series are larger also in the same proportions.

The dorsal scales are rhomboid, slightly keeled, and their posterior margin is entire, instead of being indentated laterally; they constitute longitudinal and parallel series. The caudal scales are much larger than the dorsal ones. On the flanks, the scales are disposed upon vertical series, the carination becoming very obsolete, and disappearing entirely along the lower portion; on the throat, they are notched upon their posterior margin, whilst on the abdomen, they are almost altogether entire, a few notched ones being scattered over the sides. The scales on the upper surface of the limbs are obsoletely keeled, and smooth on the lower surface, except on the sole of the feet, where they are conspicuously keeled; on the posterior aspect of the thighs, they are small, rounded, and smooth; on the tail, the scales are more strongly carinated than elsewhere.

The ground color above is of an olivaceous brown, and yellowish or dull whitish beneath. There are two lateral, narrow, and yellow streaks on each side: one extending from the orbit to the origin of the tail; the other, from the auricular aperture to the groin. The dorsal region exhibits a double series of black subcrescentic spots, convex backwards, extending from the occiput to the narrow and conical portion of the tail. The intervening zone, between the lateral streaks, exhibits also a series of black subcrescentic spots. The upper surface

of the limbs is barred with black. The abdomen is yellowish or dull whitish, unicolor in the female, whilst in the male, the sides exhibit an elongated blue patch, slightly margined with blackish, and leaving quite a wide area uncovered upon the middle region. The inferior surface of the head and the chest are mottled with bluish in both sexes, more conspicuously, however, in the male than in the female.

Loc.—Specimens of this species were collected in Oregon.

Plate XX, fig. 1, represents the male sex of *Sceloporus gracilis*, size of life.

Fig. 2, is an under view of the same individual.

Fig. 3, a profile view of the head;

Fig. 4, the head, seen from above;

Fig. 5, a front view of the head.

Fig. 6, the left hand, seen from above.

Fig. 7, the interfemoral and cloacal regions, with the posterior left limb, from beneath.

Fig. 8, a group of dorsal scales;

Fig. 9, a group of abdominal scales.

Figs. 3–9, are somewhat magnified, to render the details of their structure more apparent.

Genus PHRYNOSOMA, Wiegm.

Gen. Char.—Vertex region of the head elevated, with an even or depressed surface; temporal and occipital regions spinous. Cephalic plates small, polygonal, and subequal; occipital plate subcircular. Maxillary teeth small and subconical. Palate toothless. Tongue subelliptical, depressed, thick, papillous, and fleshy posteriorly, thin and leathery anteriorly. Sides of the neck rumpled; throat transversely wrinkled. Auricular apertures simple, granular, or denticulated in front; occasionally entirely hidden under the skin. Body rather short, or moderately elongated, very much depressed, broad, subovate or subelliptical, generally provided, on either side, with one, two, or three series of subpyramidal scales at the periphery of the abdomen. Its upper surface is scattered all over with subtriangular, scaly, sometimes erect tubercles, in the midst of small,

irregular, and imbricated scales. Neither dorsal nor caudal crests. Abdomen protected by subrhombic scales, either smooth or keeled. Limbs rather short. Tail about the length of the body or shorter, depressed and broad at the base, subconical and tapering posteriorly. Femoral pores present; preanal pores wanting.

Syn.—*Phrynosoma*, Wiegm. in *Oken*, Isis, XXI, 1828, 367; &, Herp. Mex. I, 1834, 18 & 52.—Wagl. Naturl. Syst. Amph. 1830, 145.—Gray, Synops. Rept. in *Griff.* Anim. Kingd. IX, 1831, 44; &, Catal. Lizz. Brit. Mus. 1845, 227.—Dum. & Bibr. Erpét. gén. IV, 1837, 311.—Holbr. N. Amer. Herp. II, 1842, 85.—Fitz. Syst. Rept. I, 1843, 78.—Dum. & A. Dum. Catal. méth. Rept. Mus. d'hist. nat. I, 1851, 78.—Grd. in *Stansb.* Expl. Vall. Gr. Salt Lake, Utah, 1852, 354.—Hallow. in *Sitgr.* Rep. Exped. Zuni and Color. Rivers, 1853, 119.

Observ.—There is no group in the Saurian order that may so readily be distinguished as that of *Phrynosoma*. A body more or less circular in shape, always depressed, sometimes flattened, scattered all over with irregular and spine-like shields, in the midst of small and irregular scales; a solid and subtriangular head, provided with acute spines or tuberculous knobs; a short and conical tail, covered with scales similar to those of the body, sometimes even more prominent, are as many conspicuous features, which must strike any one at the very first glance. The general aspect of these reptiles, mayhap their sluggishness, will recall to mind a frog or a toad: hence, the vernacular appellation of horned toads or horned frogs. The naturalist, however, with no hesitation, recognizes in them true Saurians, inasmuch as the body, instead of being smooth, like that of either toads or frogs, is covered, as just stated, with scales of a peculiar type. Besides the spines of the head, the tail, although short, is another feature by which they differ from both toads and frogs. So much when these animals are at rest: so soon as they move, the observer cannot fail to be struck with the fact that Phrynosoms never jump or leap, as is the case with the Batrachians, to which they have been compared.

If we look now more closely at the zoölogical peculiarities of the group of *Phrynosoma*, we will observe that the vertex is a prominent region of the head, subtriangular or cordiform, with a sharp and projecting margin, forming a ridge, overlapping the orbits; sometimes, it is provided posteriorly with two spines, one at each angle. The occipital region generally exhibits the largest spines in those species in which they exist as a conspicuous feature. The temporal region

is very much developed, and projects over the auricular aperture, being, moreover, provided, upon its projecting margin, with spines or conical plates, the largest of which approximating the occiput. The eyes seem as if situated in the middle of a groove, extending from the snout to the occiput, on account of the projection of the supraciliary ridge and the mastoid region. The lower jaw is generally bordered with a row or two of large plates, which vary in structure and shape, according to the species. The snout is either truncated or acute. The nostrils are conspicuous, and situated near the extremity of the snout, either within the inner margin of the supraciliary ridge, else upon its direct prolongation. The upper surface and sides of the head, not occupied by the spines or tuberculous knobs, are covered with small polygonal plates, varying in size, according to the area over which they extend; they are exceedingly small in advance and behind the orbits. The surface of these plates is rugose, wrinkled, or keeled, as likewise the surface of the spines themselves. The surface of the eyelids is covered with minute scales of a granular appearance; the margin of the eyelid itself is ornamented with a double row of subquadrangular plates, somewhat larger than the granules just alluded to. The inferior surface of the head, from the chin to the chest, is covered with small scales, characteristic in each species. The neck is generally very short, appearing as if contracted, the result of which contraction would be the presence of several folds of the skin, concealing the auricular apertures, placed close to the projection of the temples.

The scales of the upper surface of the body are very irregular in size and shape; on the neck, above and below, at the axillae, along the sides of the back, and at the groins, they assume a granular appearance, while along the middle of the back, and on the tail, they appear like thin lamellae, still very irregular, and carinated or subcarinated. All over the back, sides, tail, and hind limbs, there are large, irregularly pyramidal scales, with an acute point, and a wrinkled or ridged surface. The periphery of the abdomen exhibits one, two, or three horizontal series of these pyramidal scales, bent backwards, extending from the fore limbs to the hind ones. The species in which the scales of the back are the largest, is *P. coronatum*, while that in which the scales are the least developed, is *P. modestum*, whose external appearance is, in a great measure, destitute of that roughness which is generally associated with the idea of these reptiles.

The abdominal scales are subquadrangular or rhomboid, either

smooth or keeled, according to the species. On the breast and anterior portion of the shoulders, several rows of the largest scales are seen, very prominent, very acute posteriorly, and strongly carinated or keeled. The anterior and upper aspects of the thighs are likewise provided with large scales, though much less conspicuously keeled than at the shoulders.

The tail is always depressed at its base: it diminishes very rapidly posterior to the vent, becoming cylindrical toward its tip. The pyramidal and raised scales are sometimes more conspicuous upon its sides and upper surface, than on the surface of the body itself. The scales beneath, in the vicinity of the vent, have the general appearance of those of the belly; in the postanal groove, some larger scales may occasionally be seen: here, the scales assume a subverticillated arrangement; upon the conical portion of this organ, they are carinated, while they are generally smooth about the vent.

The fore and hind limbs are nearly equal-sized; the latter, however, being somewhat stouter. The fingers and toes, five in number, are moderate: the first and fifth are the shortest, and either of equal length or the fifth may be a little longer; the second and fourth somewhat longer than the first and fifth, and likewise either of equal length or the fourth somewhat longer than the second; the third is always the longest. The scales extend all over the toes, overlapping even the base of the nails: they assume a subtriangular shape, very much acuminated posteriorly, and very distinctly keeled. The nails themselves are curved, compressed at the base, and very acute at the tip. On the inferior surface of the hind limbs, along the thigh, a series of pores is observed, the femoral pores, varying in number and conspicuousness according to the species. The anal pores are totally absent in this group.

There is a structural peculiarity in some species worthy of a special remark: we allude to the auricular apertures, which, in some instances, are entirely hidden under the skin. When this fact was first noticed, upon a specimen from the Colorado Desert, it was made the ground for the establishment of a new genus, under the name of *Anota*. The same structure we find now, more or less transitory in *Phrynosoma modestum*, described on a former occasion, though, at the time we published its description, it was not apparent upon the specimens we had examined. Subsequent collections, containing numerous individuals, threw all desirable light on this subject, by exhibiting every

stage between a completely hidden auricular aperture and a perfectly visible one, sometimes on the right, at others on the left side, and also on both sides, on the same specimen. Moreover, *P. platyrhinum*, which has permanent auricular apertures, is congeneric with *P. modestum* and *Anota mc'calli*, as shown further on.

The genus *Phrynosoma* is, truly speaking, an American type of Saurians. The geographic distribution of its species reads, thus far, as follows:

1. PHRYNOSOMA ORBICULARE,—in the Valley of Mexico.

2. PHRYNOSOMA HERNANDESI,—in Western New Mexico and Sonora.

3. PHRYNOSOMA ORNATISSIMUM,—in the eastern mountainous regions of New Mexico.

4. PHRYNOSOMA BREVIROSTRUM,—in the plains of Kansas and Nebraska.

5. PHRYNOSOMA DOUGLASSI,—in the mountainous range from Puget Sound to the Colorado Desert, embracing the Valley of the Great Salt Lake of Utah.

6. PHRYNOSOMA CORONATUM,—in Upper California; west of the Rocky Mountains.

7. PHRYNOSOMA CORNUTUM,—in Texas, from the Gulf of Mexico to the mountains of New Mexico.

8. PHRYNOSOMA REGALE,—in the Valleys of the Zuni and Colorado Rivers.

9. PHRYNOSOMA MC'CALLI,—in the Colorado Desert.

10. PHRYNOSOMA PLATYRHINUM,—in the Valley of the Great Salt Lake of Utah.

11. PHRYNOSOMA MODESTUM,—in the Valley of the Rio Grande del Norte (Rio Bravo).

Thus, making eleven species with which we are thoroughly acquainted. Those which have been mentioned or described under the names of *Phrynosoma bufonium*, *P. harlani*, *P. wiegmanni*, *P. blainvillei*, *P. solaris*, and *P. planiceps*, are mere synonyms, which will be found under their proper headings.

There are various characters according to which the above species may be subdivided into minor groups. If the position of the nostrils

is taken into consideration, we will have, on the one hand, those in which these apertures are situated within the extension of the supraciliary ridge: *P. cornutum, regale, mc'calli, platyrhinum,* and *modestum;* and, on the other hand, *P. orbiculare, hernandesi, douglassi, ornatissimum, brevirostrum,* and *coronatum,* in which these same apertures are situated upon the extension of the supraciliary ridge: hence, more lateral than in the former group. At one time, the pyramidal scales at the periphery of the abdomen were thought of some value in that respect, being either disposed upon one or a double series: there is a double row of them in *P. cornutum* and *coronatum,* and one series only in *P. orbiculare, douglassi, hernandesi, ornatissimum, brevirostrum, regale,* and *platyrhinum; P. mc'calli* exhibits a triple series of them, and in *P. modestum,* they are entirely absent. The profile of the head, whether the snout is protruding or abbreviated, would bring into one group *P. orbiculare, hernandesi, ornatissimum, coronatum, cornutum,* and *regale,* and into another, *P. brevirostrum, mc'calli, platyrhinum,* and *modestum. P. douglassi,* as it now stands, would enter both groups; still, as it is probable, that there are yet two species combined under that name, one may exhibit an abbreviated snout, and a protruding one in the other. If the abdominal scales are taken into consideration, we will have on one hand *P. cornutum, regale, mc'calli,* and *modestum,* although, in the two latter, they are but slightly keeled, and, on the other hand, *P. orbiculare, hernandesi, douglassi, ornatissimum, brevirostrum, coronatum,* and *platyrhinum,* where they are smooth.

In neither case would we have a natural subdivision. The various folds of the neck and shoulder, as well as the auricular apertures, are of no better avail in this respect. Indeed, minor subdivisions of the genus *Phrynosoma* have hitherto appeared to us as a breach into the natural affinities of its species, and, at the time we offered "A Monographic Essay" of the latter, we held it as an idle attempt.*

After a laborious study of one of the most extensive collections of these Saurians, now in the Museum of the Smithsonian Institution, we offer the following Prodrom, as embodying our present thoughts upon the subject.

* In Stansbury's Exploration of the Valley of the Great Salt Lake of Utah, 1852, 354.

Subgenus TAPAYA, Cuv.

Gen. Char.—Head moderate or large; vertex more or less inclined forwards; snout obtuse or somewhat protruding. Nostrils lateral, situated at the extremity of the supraciliary ridge. Cephalic plates small or moderate, rugose; spines short and subconical, sometimes very much attenuated. Lower labials posteriorly large and acuminated. Submaxillar shields small and ridged. Mental scales small and equal. Auricular apertures extant, simple or denticulated in front. Sides of the neck and throat rumpled. One series of subpyramidal scales at the periphery of the abdomen. Abdominal scales smooth. Coloration: greyish or brownish above, maculated with black; beneath whitish or yellowish, unicolor, or spotted with black.

Syn.—*Tapayes*, Cuv. Règn. Anim. II, 1817, 35; 2d ed. II, 1829, 37; &, ed. illustr. Rept. 53.

Tapayea (Cuv.), Gray, Catal. Lizz. Brit. Mus. 1845, 227.

Observ.—The large and depressed head, provided with moderate or diminutive spines, the large posterior lower labials, and the rather small and uniform gular scales, constitute the most prominent features of this genus. We observe also constantly one series of well-developed pyramidal scales at the periphery of the depressed body; and, the scales which cover the abdominal region are always smooth.

1. Tapaya orbicularis, Cuv.

Spec. Char.—Head rather small, anteriorly declivous; vertex rather narrow; tips of the jaws protruding. Cephalic plates moderate. Occipital and temporal spines stout, though moderately elongated. Submaxillar shields small, ridged, largest posteriorly. Auricular apertures minutely serrated anteriorly. Mental scales small and subequal. A conspicuous gular fold, covered with minute scales. Abdominal scales large, subrhomboid, acuminated. Femoral pores distant; series from either side not continuous across the interfemoral region. Dark reddish-brown above, with a double or quadruple

series of black spots or blotches, posteriorly light-margined. Beneath yellowish, maculated with jet-black.

Syn.—*Tapaya orbicularis*, Cuv. Règn. Anim. II, 1817, 35; 2d ed. II, 1829, 37; &, ed. illustr. Rept. 53.

Phrynosoma orbiculare, Wiegm. in *Oken*, Isis, XXI, 1828, 367; &, Herp. Mex. I, 1834, 53. Tab. VIII, fig. 1.—Wagl. Descr. & Icon. Amph. 1828. Tab. XXIII, figs. 1 & 2; &, Naturl. Syst. Amph. 1830, 146.—Schinz, Naturg. u. Abbild. Rept. 1833, 88. Tab. XXVII. fig. 2.—Dum. & Bibr. Erpét. gén. IV, 1837, 321.—Gray, Synops. Rept. in *Griff.* Anim. Kingd. IX, 1831, 45; &, Catal. Lizz. Brit. Mus. 1845, 228.—Grd. in *Stansb.* Expl. Vall. Gr. Salt Lake, Utah, 1852, 359.

Agama orbicularis, Daud. Hist. nat. Rept. III, 1805, 406.—Voigt, Uebers. Thierr. Cuv. II, 1831, 54.

Phrynosoma orbicularis, Gravenh. in Nov. Act. Acad. nat. cur. XVI, II, 1834, 911. Tab. LXIII.

Phrynosoma wiegmanni, Gray, in *Beechey*, Voy. to the Pacif. Zool. 1839, 96.

Tapayaxin, *Lacertus orbicularis*, Hernand. Nov. Plant. Anim. Min. Mex. Hist. 1648, 67.

The Tapayaxin of Mexico, Griff. Anim. Kingd. IX, 1831, 124.

Obsery.—Characterized by its small head and cephalic spines, which are larger than in any other species of the same genus.

Loc.—Valley of Mexico.

2. Tapaya hernandesi, Grd.

Spec. Char.—Head rather large, depressed; vertex broad, slightly inclined anteriorly; snout protruding. Cephalic plates small. Occipital and temporal spines small and conical. Submaxillar shields moderate. Auricular apertures simple, granular. Mental scales very small: the series adjoining the submaxillar shields larger than the rest. Several folds under the throat, minutely granular. Abdominal scales small and subrhomboid, acuminated. Femoral pores small, not continuous across the interfemoral region. Blackish-brown above, with a double or quadruple series of black, light-margined spots. Beneath yellowish, unicolor, else obscurely maculated.

Obsery.—Allied to the preceding species, from which it chiefly

differs by its larger head, less-developed cephalic spines, and its smaller abdominal scales.

Loc.—New Mexico.

3. Tapaya ornatissima, Grd.

Spec. Char.—Head large, broad, and depressed; vertex slightly sloping forwards; snout subacute. Cephalic plates small. Occipital and temporal spines very short, subconical, and acerated. Submaxillar shields rather small, ridged. Labial plates small, except the four posterior lower ones, which are more developed, flattened, acute, and projecting. Two pyramidal spines at the angle of the mouth. Anterior margin of the auricular aperture provided with a series of granules, larger than the surrounding ones. Mental scales very small and uniform; prescapular and gular folds minutely granular. Sides of the neck spinous. Abdominal scales small, subrhomboid, posteriorly obtuse. Femoral pores small: the series from either side widely separated upon the interfemoral region. Tail rather short, broad, and depressed at the base, subconical, and attenuated posteriorly. Reddish-brown above, with a double series of chestnut-yellowish, orange-margined blotches over the body and tail, and specks of the same bright hue interspersed between the darker spots and towards the sides. Beneath yellowish, unicolor, else the abdomen and chin are maculated with greyish-black.

Syn.—*Phrynosoma orbiculare*, Hallow. in *Sitgr.* Rep. Expl. Zuni & Color. Rivers, 1853, 125. Pl. viii & ix.

Observ.—The double row of dorsal spots, instead of being arranged in pairs, as is usually the case in other species, and especially in *T. douglassi*, have a proclivity to alternate, sometimes to a very marked degree.

Loc.—Mountainous region of New Mexico.

4. Tapaya brevirostris, Grd.

Spec. Char.—Head large, depressed; vertex slightly sloping forwards; snout abbreviated and rounded. Cephalic plates moderate. Occipital and temporal spines very short and subconical. Submaxillar shields moderate and ridged. Labial plates moderate; five posterior lower ones largest, flattened, and projecting; the fifth being pyramidal, and near the angle of the mouth. Anterior margin of the auricular aperture serrated or denticulated. Mental scales small and uniform; gular folds subgranular; prescapular fold minutely granular. Sides of the neck spinous. Abdominal scales moderate, subrhomboid, posteriorly obtuse. Femoral pores small, distant: the series from either side widely apart upon the interfemoral region. Tail of moderate length, broad and depressed at the base, subconical and tapering posteriorly. Olivaceous-brown above, with a quadruple series of black, posteriorly yellow edged, spots; beneath yellowish, unicolor, except the chin, which exhibits, sometimes, small blackish spots.

Observ.—This species resembles more *T. douglassi* than any other of its congeners. Its abbreviated head, and, in fact, its entire physiognomy, is suggestive of *Doliosaurus platyrhinos*, alluded to further on, to which, however, it bears no close affinities.

Loc.—Plains of Kansas and Nebraska.

5. Tapaya douglassi, Grd.

(Plate XXI, figs. 1–5.)

Spec. Char.—Head large, depressed; vertex slightly declivous; snout subconvex or rounded, subdepressed at the nostrils. Cephalic plates moderate, very rugose. Occipital and temporal spines reduced to small acerated cones. Submaxillar shields moderate and ridged. Auricular aperture granular, subtubercular, or subdenticulated in front. Labial plates moderate. Mental scales small and subequal; gular folds minutely scaly. Abdominal scales moderate, subrhomboid, posteriorly obtuse. Femoral pores distant: the series from

either side approximating upon the interfemoral region without being continuous. Olivaceous-grey or brown above, with a double or quadruple series of black spots, posteriorly margined with white or yellow; beneath whitish or yellowish-white, generally unicolor, occasionally speckled with jet-black.

Syn.—*Agama douglassii*, Bell, in Trans. Linn. Soc. Lond. XVI (1828), 1833, 105. Pl. x.—Harl. Med. & Phys. Research. 1835, 141. Fig. 3.

Phrynosoma douglassii, Wagl. Naturl. Syst. Amph. 1830, 146.—Gray, Synops. Rept. in *Griff.* Anim. Kingd. IX, 1831, 44; Catal. Liz. Brit. Mus. 1845, 227; &, in *Beech.* Voy. to the Pacif. Zool. 1839, 96.—Wiegm. Herp. Mex. I, 1834, 54.—Dum. & Bibr. Erpét. gén. IV, 1837, 323.—Holbr. N. Amer. Herp. II, 1842, 101. Pl. xiv.—Fitz. Syst. Rept. I, 1843, 78.—Grd. in *Stansb.* Expl. Vall. Gr. Salt Lake, Utah, 1852, 361 & 362. Pl. vii, figs. 6–10.

Phrynosoma ornatum, Grd. MSS. (accompanying Atlas.)

Observ.—As already observed (page 393), two species may yet be confounded under this heading, one peculiar to the Northwest Coast, the other to the Great Salt Lake Basin. The specimen figured belongs to the latter region; and at the time the accompanying plate was engraved, we thought we had found tangible characters to discriminate them. All the specimens from the Northwest Coast are much smaller than those of the more southern region of Utah; but, since this fact might still be regarded by some as bearing upon the climate, we have, so far, refrained recording them as distinct species.

Descr.—The head itself is quite depressed, and the vertex but slightly sloping towards a rather rounded snout. The temporal regions are yet prominent, though the spiny processes contribute very little towards their expansion. All the cephalic spines are sometimes so much reduced in their development as to appear like mere knobs. The upper labials are narrow and elongated, not larger, however, than the supralabials, though much smaller than the temporal plates. The cephalic plates are small and polygonal; their surface exhibiting a fine meandric meshwork in relief. The scales under the head are very small, subequal, and smooth. The submaxillar plates are moderate, exteriorly ridged, thirteen in number, increasing in size posteriorly to the tenth, whilst the three remaining ones are slightly smaller, ascending, towards the angle of the mouth, to meet the lower labials. The latter are quite narrow and small anteriorly, increasing in size posteriorly, where the four last are nearly as large as the largest submaxillars.

The dorsal scales have a comparatively smooth appearance, being but slightly keeled. The large scales, which are interspersed in the midst of the small ones, are generally less numerous than in the other species of the genus. There is but one well-developed series of pyramidal scales at the periphery of the abdomen. One series of them may be observed on the sides of the tail, and scattered ones over its upper surface. The abdominal scales are smooth, and rather more developed upon the middle region than towards the sides; also more so anteriorly than posteriorly. The scales covering the upper and anterior aspects of the limbs are but slightly keeled, whilst they are smooth beneath and behind. The femoral pores number from fourteen to eighteen on either side, and, as usual, more conspicuous in the male than in the female, closely approximating upon the interfemoral region, over which they extend, without forming a continuous series.

The ground color above is greyish-olive or brown. A large, elongated, black patch is observed on either side of the neck. A double or quadruple series of black spots, sometimes united into transverse bands, exist on the upper region of the body; five more of such bands may be seen on the caudal region. Their posterior margin, or else the entire intervening space, is of a yellow or of an orange hue. The upper surface of the limbs is barred, spotted, or clouded with blackish. Beneath, the ground color is either yellowish (in the female), or whitish (in the male), unicolor, else more or less thickly dotted with black. The dots are oftentimes so crowded under the head, as to give that region quite a dark appearance.

Loc.—Mountainous regions of Oregon. Less common west of the Rocky Mountains than eastwardly.

Plate XXI, fig. 1, represents a side view of the female sex of *Tapaya douglassi*, size of life.

Fig. 2, is an upper view; and,

Fig. 3, an under view of the same specimen.

Fig. 4, a front view of the head.

Fig. 5, the thighs and postanal region of the male sex.

Subgenus BATRACHOSOMA, Fitz.

Gen. Char.—Head rather large; vertex very much inclined forwards; snout protruding. Nostrils lateral, situated at the extremity of the supraciliary ridge. Cephalic plates moderate and rugose. Spines large. Submaxillar shields large, flattened, and acuminated. Auricular apertures extant. Six approximated series of large, mental scales. Sides of the neck rumpled; throat transversely wrinkled. A prescapular fold. Two horizontal series of pyramidal scales at the periphery of the abdomen. Abdominal scales smooth.

Syn.—*Batrachosoma*, Fitz. Syst. Rept. I, 1843, 79.

Observ.—Position of nostrils and abdominal scales smooth, as in *Tapaya;* cephalic spines and physiognomy, as in *Phrynosoma.* Series of large mental scales peculiar. The pyramidal scales at the periphery of the abdomen, being disposed upon two series, constitute a feature foreign to *Tapaya*, and somewhat akin to *Phrynosoma.*

Batrachosoma coronatum, Fitz.

(Plate XX, figs. 10–13.)

Spec. Char.—Two occipital and five temporal spines. Labial plates small, subequal. Submaxillar shields large, flattened, exteriorly sharp-edged: the middle ones largest. Lower series of subpyramidal scales at the periphery of the abdomen, much smaller than the upper. Scales under the head keelless, unequal: three or four double longitudinal rows, upon the middle region, larger than the rest, and acuminated. Abdominal scales subrhomboid, subacute. Thirteen or fourteen pores under each thigh. Ground color greyish or yellowish-brown above, maculated with black; beneath yellowish, with scattered blackish spots.

Syn.—*Phrynosoma coronatum*, Blainv. in Nouv. Ann. Mus. d'hist. nat. IV, 1835. 284. Pl. xxv, fig. 1, *a b c.*—Dum. & Bibr. Erpét. gén. IV, 1837, 318.—Holbr. N. Amer. Herp. II, 1842, 97. Pl. xiii.—Grd. in *Stansb.* Expl. Vall. Gr. Salt Lake, Utah, 1852, 360. Pl. viii, figs. 7–12.—Hallow. in *Sitgr.* Rep. Exped. Zuni and Color. Rivers, 1853, 122.

Phrynosoma blainvillei, GRAY, in *Beechey*, Voy. to the Pacif. Zool. 1839, 96. Pl. XXIX, fig. 1 (young); &, Catal. Liz. Brit. Mus. 1845, 228.

Batrachosoma coronatum, FITZ. Syst. Rept. I, 1843, 79.

Phrynosoma solaris, GRAY (Brit. Mus.), Catal. Liz. Brit. Mus. 1845, 229.

DESCR.—The general proportions of the body are rather elongated. The head is depressed, the vertex somewhat inclined forwards, and the occipital and temporal spines leaning backwards. The nostrils, being situated upon the anterior extremity of the supraciliary ridge, are lateral. The snout is declivous. The cephalic plates are polygonal, moderate, nodulous, or reticulated; those of the temporal region are the most conspicuous, and more distinctly keeled. The temporal spines are stout, three in number, and preceded anteriorly by two strongly developed plates, the rudiments of two other spines, and which reach the very margin of the upper jaw. The occipital spines are slightly curved, reclining towards the neck. There are six submaxillar plates, increasing slightly in size from the foremost to the fifth; the sixth being equal to the fourth. The labial plates are very small; and the inframaxillar area rather narrow. Besides, there exists a large triangular plate at the infero-posterior angle of the mouth, with its apex directed horizontally outwards. Although the submaxillar plates do not extend as far back as the angle of the mouth, yet the series of these plates is continued by three small scales or plates situated immediately beneath the triangular plate at the infero-posterior angle of the mouth, leading to a subconical scale-like plate placed obliquely behind the latter. Upon the middle region of the chin we observe four pairs of longitudinal series of scales larger than the rest, the outer series being the largest, and acuminated. Several folds of the skin may be seen under the neck, as well as on its side, upon the edge of which some large pyramidal scales are observed.

The upper series of pyramidal scales, at the periphery of the abdomen, extends from the shoulder to the groin, being much more conspicuous than the lower series, which occupies the middle region of the abdomen only. The abdominal scales are more of a quadrangular shape than rhomboid; those on the pectoral region being but very slightly larger than the rest, and all of them smooth or keelless. The femoral pores are rather apart; thirteen or fourteen, on either side, approximating somewhat upon the interfemoral region, though far from constituting a continuous series. The scales on the preanal

region are about equal sized with those of the pectoral region. Under the base of the tail, the scales are likewise smooth; and, in the male sex, they are larger immediately behind the vent than elsewhere. Along the conical portion of the tail, the scales underneath are slightly keeled.

The ground color is greyish-brown above, with a black patch on each side of the neck. Three transverse blotches of black, interrupted upon the middle region of the back, exhibit posteriorly two light spots. Four transverse and similar bands may be traced along the caudal region. The limbs are likewise barred with black. The inferior region is yellowish; the head, belly, and tail, scattered all over with small blackish spots; the limbs remaining unicolor.

Loc.—This species occurs in Upper California.

Plate XX, fig. 10, represents the profile of the male sex of *Batrachosoma coronatum*, size of life.

Fig. 11, is a view from above; and,

Fig. 12, a view from beneath of the same individual,

Fig. 13, being a front view of the head.

Subgenus PHRYNOSOMA (Wiegm.), Grd.

Gen. Char.—Head rather large; vertex rather inclined forwards; snout rather protruding. Nostrils anterior, situated within the extension of the supraciliary ridge. Cephalic plates small and rugose; spines very large. Submaxillar shields large, sharp-edged. Auricular apertures extant. Two distant rows of mental scales more developed than the rest, though rather small, and slightly keeled. Sides of the neck rumpled; throat transversely wrinkled. A pectoral or prescapular fold. Two horizontal series of subpyramidal scales at the periphery of the abdomen. Abdominal scales carinated. Coloration: yellowish or olivaceous, maculated above with black; beneath unicolor, or spotted.

Syn.—*Tropidogaster*, Fitz. Syst. Rept. 1, 1843, 79.

Observ.—A genus *Tropidogaster* being already in existence amongst

Iguanas, since 1837,* Fitzinger's appellation could not have been retained for the present subdivision, even if that of *Phrynosoma*, in its restricted sense, could not have been applied. As matters stand, however, this is the only subgenus to which the latter name rightfully belongs.

1. PHRYNOSOMA CORNUTUM, Gray.

(Plate XXI, figs. 6–9.)

SPEC. CHAR.—Vertex very much inclined forwards; occipital region elevated. Temporal and occipital spines, subconical, long and acute; occipital ones much the largest and raised above the others. Labial plates small, unequal. Scales under the chin very small, with two distant series of more developed ones, and acute. Lower series of subpyramidal scales at the periphery of the abdomen conspicuously developed, though somewhat smaller than the upper series. Abdominal scales small, subrhombic, acute, and conspicuously keeled. Femoral series of pores not extending over the interfemoral region, hence widely apart. Postanal scales small. Ground color yellowish, spotted, and clouded with blackish; beneath lighter, either unicolor or spotted with black.

SYN.—*Agama cornuta*, HARL. Journ. Acad. Nat Sci. Philad. IV, II, 1825, 299. Pl. XX; VI, I, 1829, 14; &, Med. and Phys. Research. 1835, 141, figs. 1 & 2.—GRIFF. in *Cuv.* Anim. Kingd. IX, 1831, 216 (fig.).

Tapaya cornuta, CUV. Règn. Anim. 2d ed. II, 1829, 37.

Lacerta tapayaxin, BART. Med. & Phys. Journ. III, II, 18 . . , 68.

Phrynosoma harlani, WIEGM. Herp. Mex. I, 1834, 54.—DUM. & BIBR. Erpét. gén. IV, 1837, 314.

Phrynosoma cornutum, GRAY, Synops. Rept. in *Griff.* Anim. King. IX, 1831, 45; &, Catal. Liz. Brit. Mus. 1845, 229.—HOLBR. N. Amer. Herp. II, 1842, 87. Pl. XI.—GRD. in *Stansb.* Expl. Vall. of Gr. Salt Lake, 1852, 360. Pl. VIII, figs. 1–6.—HALLOW. in *Sitgr.* Rep. Exped. Zuni and Color. Rivers, 1853, 119.

Phrynosoma bufonium, WIEGM. in *Oken*, Isis, XXI, 1828, 367.—GRAY, Synops. Rept. in *Griff.* Anim. Kingd. IX, 1831, 45.

Phrynosoma orbiculare, HOLBR. N. Amer. Herp. II, 1842, 93. Plate XII.

Phrynosoma planiceps, HALLOW. in Proc. Acad. Nat. Sci. Philad. VI, 1852, 178; &, in *Sitgr.* Rep. Exped. Zuni and Color. Rivers, 1853, 124. Plate VII.

Tropidogaster cornutus, FITZ. Synops. Rept. I, 1843, 79.

Tapayaxin, BART. Med. & Phys. Journ. III.

* Erpét. gén. IV, 1837, 329.

Observ.—This species, together with *P. coronatum*, is one of the largest of the group. It is also the one which is most commonly known, since it inhabits a more extensive geographic range than its congeners, as also regions so far more accessible to travellers and explorers. The recent settlement of California, however, has been instrumental in rendering *P. coronatum* quite common in our collections.

Descr.—The spines of the head are very conspicuously developed. There is a pair of occipitals, the largest of them all; exteriorly to which, three temporal ones may be observed, diminishing in size outwardly; finally, there is a fifth above the posterior rim of the eye, and about the size of the external occipital pair. From the supraocular spine forwards, a thick ridge (the supraciliary ridge), extends almost to the margin of the jaw, inclosing a subcordiform area, which is sloping towards the nostrils: the latter being situated within the said ridge. The snout is rather abruptly sloping. The labial plates are exceedingly small, and scarcely distinguishable from the adjoining supra- and infralabials, except the posterior lower labials, which are somewhat larger. The mento-submaxillar shields, on the other hand, constitute a very conspicuous series, quite sharp upon their outer edge, increasing gradually in size backwards: the posterior one, spine-like, lying beneath the auricular aperture. The upper surface of the head is covered with small, polygonal, reticulated, or multicarinated plates, largest upon the temporal and occipital regions, and smallest about the orbits and sides of the head. The surface of the eyelid is covered with small and smooth plates, whilst its margin is provided with keeled and somewhat larger plates. The scales at the inferior surface of the head are very small, slightly keeled, equal-sized, except a longitudinal row on each side, in which they are somewhat larger, pyramidal, slightly raised, and directed outwards and backwards. The auricular aperture is moderate, vertically oblong, and somewhat hidden in the midst of the numerous folds of the neck.

The body above is densely covered with scales of various sizes, very minute on the neck and sides of the abdomen, somewhat larger and irregular on the back and tail, where the most conspicuous may be observed, all having a tendency to be keeled. Scattered in the midst of these, may be seen much larger scales, of a pyramidal shape, raised, prickle-like, above the general surface of the body; they constitute a double series at the periphery of the abdomen, between

the axillae and the groins smaller in the lower than in the upper series; on the sides of the tail, they are disposed upon a single, irregular series, which does not extend to its tip. The abdominal scales are all distinctly keeled; there is a large and conspicuous transverse series upon the anterior part of the chest, followed by four or five considerably smaller, though still larger than the abdominal ones, properly so called, and which are uniform, rather small, subquadrangular, and posteriorly very acute; upon the middle of the preanal region, again, they are larger than upon the abdomen. The tail is broad at the base, very much depressed, subconical, and tapering into a point backwards. The scales of its inferior surface are keeled, and rather larger than the abdominal ones.

The limbs are tolerably well developed; still, the anterior pair, when bent backwards, is far from reaching the groins, whilst the posterior pair, by being brought forwards, reaches the shoulder with the extremity of the toes. Both the arm and forearm are covered superiorly and anteriorly with conspicuous, large, and keeled scales; smaller ones, though keeled, still cover the inferior aspect of these organs. About the axillae and inner aspect of the elbow, the scales become small and granular. The upper and anterior surface of the hind limbs exhibit a squamation very similar to that of the back. On the inferior surface of the thighs, the scales resemble more those of the abdomen, though smaller, being likewise keeled. There are fifteen or sixteen femoral pores under each thigh, extending from the knee to the interfemoral region, over which they are not continuous. On the inferior surface of the leg, properly so called, the scales are well developed, and strongly keeled. The hands and feet, the fingers and toes, are scaly to the very base of the nails, and the scales conspicuously keeled. Three upper and three inferior series of scales may be observed around the fingers and toes, with a slight tendency to assume a verticillated aspect, particularly underneath. The nails are well developed, slightly curved, compressed at the base, acute, and tapering at the apex.

The ground color assumes various shades of yellow. There is a transverse black streak between the supraocular spines, and one across the vertex; the snout, about the nostrils and the margin of the jaw, is maculated. A similar streak extends from beneath the eye, across the angle of the mouth; another still, stretches across the temporal region, from the eye to the extremity of the external temporal spine. The occipital spines are brownish. A large blackish patch on each

side of the neck, with a middle light zone between, extends from the occiput to the shoulders. Three pairs of similar patches may be observed along the dorsal region, the patches of the anterior pair nearly circular, and surrounded as they are by a light margin, they assumed an ocellated aspect. The patches of the two remaining pairs being undulated, their posterior light margin resemble an acute triangle. Five or six transverse black fasciae are to be observed along the surface of the tail. The rest of the upper surface is clouded with brownish. The limbs are barred and clouded like the tail. The inferior surface of the body is sometimes unicolor, at others clouded with greyish, or else distinctly maculated.

Loc.—Southwestern States of the Union.

Plate XXI, fig. 6, represents the female sex of *Phrynosoma cornutum*, in profile, and size of life.

Fig. 7, is a dorsal view, and,

Fig. 8, a view from beneath, of the same individual.

Fig. 9, exhibits a front view of the head.

2. Phrynosoma regale, Grd.

Spec. Char.—Vertex and occipital regions quite depressed. Temporal and occipital spines flat and acute, constituting a continuous series, very much inclined backwards. Labial plates proportionally well developed, unequal, and rugose. Scales under the chin small, rounded, subconvex; largest series subpyramidal and acuminated. Pectoral scales moderate, and acuminated also. Lower series of subpyramidal scales at the periphery of the abdomen, obsoletely developed. Abdominal scales subrhombic, not acuminated, and slightly, though distinctly, carinated. Femoral pores small, and closely set together; the series from either side, not continuous on the interfemoral region, over which they somewhat extend. Postanal scales very minute. Ground color brownish-olive above, back, limbs, and tail transversely maculated with black; beneath yellowish, with small black spots on the middle of abdomen.

Observ.—A most characteristic species, not only by the disposition of the temporal and occipital spines upon the same plane, but likewise

by these spines being set closely together, so as to leave no interval between them at their base. An approximation of a similar arrangement of the cephalic spines may be observed in *D. mc'calli*, in which, however, the spines themselves are not contiguous. *P. regale* is the only species which is provided with four subequal occipital spines.

Loc.—Valleys of the Zuni and Colorado Rivers.

Subgenus DOLIOSAURUS, Grd.

Gen. Char.—Head rather small and abbreviated; vertex very large, slightly inclined forwards; snout abruptly truncated. Nostrils anterior, situated within the extension of the supraciliary ridge. Cephalic plates moderate, or small, rugose; spines but moderately developed; occipitals higher than the temporal ones. Submaxillar shields large, sharp-edged. Auricular apertures sometimes but partially visible externally, else entirely hidden under the skin. Mental scales small, subequal; gular scales minute. A double or triple series of subpyramidal scales at the periphery of the abdomen, or else none at all. Abdominal scales subrhombic, smooth, or slightly carinated. Ground color olivaceous, or yellowish, maculated above with black; beneath unicolor.

Syn.—*Anota*, Hallow. in Proc. Acad. Nat. Sci. Philad. VI, 1852, 182; &, in *Sitgr.* Rep. Exped. Zuni and Color. Rivers, 1853, 127.

Observ.—This genus is more intimately related to *Phrynosoma*, than to any other of its congeners, since the abdominal scales of some of its species exhibit exiguous keels. The head, however, is smaller, more abruptly truncated, with the nasal region rather depressed. The cephalic spines are much less developed also, whilst the vertex is broader and nearly horizontal. The lower labials are small and subequal.

The auricular apertures, subjected to a good deal of variations in their external development, constitute in our opinion a general feature of no minor importance. We can only regret that the name of *Anota*, imposed by Dr. Hallowell, could not have been made available for the genus as it now stands, since it points at that structure as developed in one of the species only. Never did we feel more reluctant in coin-

ing a name, as on the present occasion. Still, it will easily be understood how the adoption of a generic name, recalling to the mind a trait of organization which is not generical, could have had a sufficient weight in counterbalancing the reluctancy just alluded to.

1. Doliosaurus mc'calli, Grd.

Spec. Char.—Cephalic plates moderate. Occipital spines rather elongated and slender. Submaxillar shields very large: posterior ones spinous. No external auricular aperture. Mental scales very small, subequal, with two distant longitudinal series of somewhat larger ones. Pectoral scales large, carinated, and acuminated. A triple series of subpyramidal scales at the periphery of the abdomen; middle one alone well developed. Abdominal scales small, slightly carinated. Femoral pores extending somewhat over the interfemoral region, though the series from either side are not continuous. Yellowish-olive above, with a dorsal black line, and a double series of rounded spots on either side of the back, uniting into one along the tail; whitish-yellow beneath, unicolor.

Syn.—*Anota mc'callii*, Hallow. in Proc. Acad. Nat. Sci. Philad. VI, 1852, 182; &, in *Sitgr.* Rep. Exped. Zuni and Color. Rivers, 1853, 127. Pl. x.

Obsery.—The back is densely covered with small, irregular, and keeled scales, with interspersed larger ones, and which are somewhat depressed: hence, its appearance is rather smooth than rough. The pyramidal scales at the periphery of the abdomen, together with those that are observed on either side of the tail, are the only asperities observed in this species. The occipital spines are but slightly higher than the temporal ones, with which they constitute a semicircle, and upon which they are disposed somewhat apart. Two of the temporal spines, on either side, are rather well developed, slender and acute, though shorter than the occipital ones. The submaxillar shields are larger than in any other species of the same group. The two mental series of scales, which are more developed than the rest, extend along the middle of their respective side, being, therefore, twice as far apart upon the medial region as their distance from the submaxillar shields. The scales upon the anterior aspect of the chest

and the arms are very large, strongly keeled, acuminated, and somewhat raised, giving a rather rough appearance to those regions. The tail is broad, depressed, and tapering.

Loc.—Deserts of the Gila and Colorado Rivers.

2. Doliosaurus platyrhinos, Grd.

Spec. Char.—Cephalic plates small. Occipital spines of moderate development. Submaxillar shields stout: posterior ones subconical. Auricular apertures generally extant. Mental scales small, subequal, with two longitudinal and very distant series of slightly larger ones. Pectoral scales moderate, subcarinated, and acuminated. One series of pyramidal scales at the periphery of the abdomen. Abdominal scales moderate, smooth. Femoral pores few, conspicuous, and distant, encroaching upon the interfemoral region, though not in a continuous series. Brownish-olive above, transversely maculated with black; beneath yellowish, unicolor.

Syn.—*Phrynosoma platyrhinos*, Grd. in *Stansb.* Expl. Vall. Gr. Salt Lake, Utah, 1852, 361 & 363. Pl. vii, fig. 1–5.

Observ.—This species has a more spinous appearance than *D. mc'calli* and *D. modestus*, without, however, approaching to anything like the species of *Phrynosoma* and *Batrachosoma*. On the other hand, the pyramidal scales at the periphery of the abdomen are but moderately developed, and those on the anterior region of the chest much less conspicuous than in *D. mc'calli*, the abdominal scales being rather smaller than in the latter species, and smooth, whilst the mental scales are more developed, and the series of larger ones occupy a more lateral and backwards position, since it extends likewise over one fold on the side of the neck. The tail is of moderate development, depressed, and tapering.

Loc.—Valley of the Great Salt Lake of Utah.

3. Doliosaurus modestus, Grd.

Spec. Char.—Cephalic plates very small. Occipital spines small. Submaxillar shields stout: posterior ones subconical. Auricular

apertures either extant or absent. Mental scales very small, equal. Pectoral scales small, subrhombic, and subcarinated. No pyramidal scales in series at the periphery of the abdomen. Abdominal scales small, and slightly carinated. Femoral pores distant, constituting a continuous series across the interfemoral region. Brownish-olive above, maculated with black; beneath yellowish-white, unicolor.

SYN.—*Phrynosoma modestum*, GRD. in *Stansb.* Expl. Vall. Gr. Salt Lake, Utah, 1852, 361 & 365. Pl. VI, figs. 4–8.

OBSERV.—The body has rather a smooth appearance, owing to the diminutiveness of the tubercular scales, and the entire absence of the pyramidal ones from the periphery of the abdomen. The mental scales are very small and equal, as in *Phrynosoma*, properly so called. The cephalic spines resemble those of *D. platyrhinos* most, though somewhat less developed. The auricular apertures are seldom fully developed: sometimes, the right is developed and the left obliterated, or else it is the reverse; most generally, they are either entirely or partially obliterated. The tail is very slender and subconical.

LOC.—Valley of the Rio Grande del Norte (Rio Bravo).

SUBFAM. ACRODONTES.

The maxillary teeth are soldered fast upon the free and even edge of the jaw bones. The body is either depressed or broader than deep, else compressed or deeper than broad. A dorsal crest in some genera; absent in others. Palatine teeth are always wanting.

SYN.—*Acrodontes*, WAGL. Naturl. Syst. Amph. 1830, 144 & 150.—DUM. & BIBR. Erpét. gén. IV, 1837, 375.—DUM. & A. DUM. Catal. méth. Rept. Mus. d'hist. nat. I, 1851, 86.

OBSERV.—The remarks made under the heading of the *Pleurodontes* (page 313), will equally apply to the *Acrodontes*. The latter are all inhabitants of the Old World.

Genus BRONCHOCELA, Kaup.

Gen. Char.—Head subpyramidal, more or less elongated, not swollen laterally, and protected by small angular plates. Occipital plate small. Subconical incisive teeth upon the extremity of the jaws: compressed, subtriangular, and tricuspid ones posteriorly. Nostrils lateral, perforating an odd plate, situated near the apex of the muzzle. No transverse fold under the neck. Skin, more or less hanging down upon the throat. A dorsal crest extending from the nape to the tail. Scales of the trunk homogeneous, imbricated, disposed upon oblique series, inclined backwards, their free edge being directed towards the belly. Femoral pores wanting.

Syn.—*Bronchocela*, Kaup, Isis, XX, 1827, 619.—Gray, Synops. Rept. in *Griff.* Anim. Kingd. IX, 1831, 55; &, Catal. Liz. Brit. Mus. 1845, 240.—Dum. & Bibr. Erpét. gén. IV, 1837, 394.—Dum. & A. Dum. Catal. méth. Rept. Mus. d'hist. nat. I, 1851, 86.

Observ.—Intimately related to *Calotes*, from which it chiefly differs by the direction of the oblique series of scales which cover the upper surface of the body. The cephalic plates, in *Calotes*, are imbricated in such manner as to present their free edge anteriorly, contrarily to the general rule, which consists in that free edge being directed backwards. The sides of the head, in *Calotes*, are likewise swollen; a feature not met with in *Bronchocela*.

Bronchocela cristatella, Kaup.

Spec. Char.—Dorsal crest tolerably elevated over the neck, but diminishing suddenly over the shoulders, to proceed thus towards the tail. Two or three small, subconical, and expanded scales behind the supraorbital ridge. No conical tubercles on the nape; no tubercular scales over the auricular aperture. Scales of the sides of the body narrow, lanceolated, keeled, scarcely half the size of those on the belly. Color uniformly blue or green.

Syn.—*Lacerta mexicana strumosa, &c.* Seba, I, Thes. Nat. 1734, 140. Tab. lxxxix, fig. 1.

Agama cristatella, Kuhl, Beitr. zur Zool. und Vergl. Anat. 1820, 108.

Agama gutturosa, Merr. Tent. Syst. Amph. 1820, 51.

Agama moluccana, Less. Voy. Coq. Zool. II, 1, 1830, 34. Pl. 1, fig. 1.—Schinz, Naturg. und Abbild. Rept. 1833, 90. Tab. xxx.

Agama vultuosa, Gray, in *Hardw.* Icon. Ined. Tab. lxxx, 81–83.

Calotes gutturosa, Guer. Iconogr. Règn. Anim. 1833. Tab. vii, fig. 3.

Calotes cristatellus, Schinz, Naturg. und Abbild. Rept. 1833, 86. Tab. xxvi, fig. 1.

Calotes gutturosus, Wiegm. Herp. Mexic. 1, 1834, 14.

Bronchocela cristatella, Kaup, in *Oken*, Isis, XX, 1827, 619.—Dum. & Bibr. Erpét. gén. IV, 1837, 395.—Gray, Catal. Liz. Brit. Mus. 1845, 241.

Blue Calotes, Gray, Synops. Rept. in *Griff.* Anim. Kingd. IX, 1831, 55.

Descr.—The body is compressed, sloping towards the abdomen from the middle line of the back, which is thus rendered more conspicuous than if the same region were rounded. The tail is very long and slender, more than three times the length of the body and head combined, subtriangular upon its base, conical upon the second third of its length, and quadrangular, very much diminished, upon the last third.

The head is subpyramidal, its upper surface being slightly depressed upon the fronto-nasal region, whilst the interocular region appears grooved, from the fact that the ocular region is raised and convex. The cephalic plates are very small, polygonal, nearly equal, keeled. The nostrils perforate one, rather conspicuous plate, situated upon the side of the snout, immediately beneath the canthus rostralis, which is continued over the orbit as the supraorbital ridge (supraciliary of some writers), behind which, and just over the temporal region, may be seen two or three small, subconical, expanded, and raised scales, forming the immediate continuation of the said ridge. The auricular aperture is quite large, surrounded by small plates or scales, and exhibiting its tympanum near the surface. The scales under the head are well developed, keeled, anteriorly lanceolated, posteriorly sublozenge-shaped; a longitudinal fold of the skin being observed from the hyoid apparatus to the chest. A horizontal and much wider fold may be seen extending from the posterior extremity of the lower maxillary to the shoulder, over the insertion of the fore limbs. The scales over the region of the neck are smaller than under the head and throat, though a good deal larger than those of the back; they are conspicuously carinated, and more or less subpyramidal or lanceolated in their outline. The dorsal crest is tolerably elevated just over the nape, where it is composed of erect, slender, lanceolated plates: as it

reaches the shoulders, it is suddenly lowered, composed now exclusively of one series of very convex, much larger scales than the adjoining ones on the sides of the back; over the tail, the crest merges into a slight ridge, scarcely distinguishable from the carination of the other scales. On the upper surface of the tail, the scales are much larger and broader than on the sides of the body, and nearly equal in size to those observed over the limbs. On the abdomen, and inferior surface of the tail, the scales are the largest, and strongly carinated, as also under the limbs. The latter are slender and elongated; the fingers and toes being unequal, and of slender appearance.

The coloration of this species is uniformly blue or green; sometimes, blue-spotted, upon a green ground; the tail being posteriorly brown, spotted, or else semi-annulated with black.

Loc.—Singapore.

Genus AMPHIBOLURUS, Wagl.

Gen. Char.—Head depressed, subtriangular, rather elongated, covered with small, carinated, subequal, posteriorly acute, or subacute scales. Occipital plate very small. Nostrils lateral, situated beneath the supraciliary ridge. Supralabial plates and temporal scales carinated. Tongue fungoid, narrow, anteriorly notched, or bifid. Compressed and cutting teeth on the sides of the jaws, and subconical incisors anteriorly. Auricular apertures large, simple, or subdenticulated, with the tympanum near the surface. Sides of neck with longitudinal folds; a pectoral fold, simple. Nape and back more or less distinctly crested. Dorsal scales heterogeneous, imbricated, and carinated; abdominal scales subequal and carinated also. Femoral pores in the male sex only; no preanal pores in either sex. Limbs moderately developed; five fingers and five toes, simple, compressed, unequal. Tail slender, very long, and tapering, depressed at the base, over which the dorsal crest tapers away. Coloration: brown or yellowish-brown, with irregularly transverse and dark bands or fasciae.

Syn.—*Amphibolurus*, Wagl. Naturl. Syst. Amph. 1830, 145.—Wiegm. Herp. Mex. I, 1834, 17.—Fitz. Syst. Rept. I, 1843, 83.—Gray, Catal. Liz. Brit. Mus. 1845, 232.

OBSERV.—This genus, a dismemberment of that of *Grammatophora*, was instituted by Wagler, though not adopted by all subsequent writers on the subject. We are inclined to think that it is a happy subdivision, since it is better understood. The acquisition of a second well-marked species seems likewise to militate in favor of its adoption in the scientific nomenclature.

1. AMPHIBOLURUS MURICATUS, Wagl.

SPEC. CHAR.—A scaly, crested ridge along the middle line of the back. Sides of the hind part of the head spineless. Scales of the throat not hanging down, strongly carinated, as are also those of the abdomen. Sides of the body with some short, erect scales. Tail without cross rows of spines upon its upper surface. Ground color fulvous, maculated with black above; pale brown beneath, unicolor.

SYN.—*Lacerta muricata*, SHAW, Gen. Zool. III, I, 1802, 211. Pl. LXV, fig. 2.

Agama grandoculis, LACEP. in Ann. Mus. d'hist. nat. IV, 1804, 191.

Agama muricata, DAUD. Hist. nat. Rept. III, 1805, 391.—MERR. Tent. Syst. Amph. 1820, 53.—CUV. Règn. Anim. 2d ed. II, 1829, 36.

Agama jacksoniensis, KUHL, Beitr. zur Zool. &c. 1820, 113.—GUER. Iconogr. du Règn. Anim. 1831. Pl. III, fig. —SCHINZ, Naturg. und Abbild. Rept. 1833, 90. Tab. XXX.

Grammatophora muricata, KAUP, Isis, XX, 1827, 621.—GRAY, Synops. Rept. in *Griff.* Anim. Kingd. IX, 1831, 60; in *Grey*, Journ. two Exped. Austr. II, 1841, 438; &, Catal. Liz. Brit. Mus. 1845, 251.—DUM. & BIBR. Erpét gén. IV, 1837, 475.—DUM. & A. DUM. Catal. méth. Rept. Mus. d'hist. nat. I, 1851, 100.

Amphibolurus muricatus, WIEGM. Herp. Mexic. I, 1834, 17.—WAGL. Naturl. Syst. Amph. 1830, 145.—FITZ. Syst. Rept. I, 1843, 84.

The muricated Lizard, SHAW, in *White*, Journ. Voy. N. S. Wales, 1790, 244. Pl. XXXI, fig. 1.

Lézard ou Agame gros yeux, LACEP. (vide supra.)

OBSERV.—We might almost have limited ourselves to a few remarks upon this species,—it having been described by the various authors quoted in the above synonymy,—were it not that their descriptions are rather incomplete. This animal appears to be so common, or at least so widely spread over the Australian Isle, that most of the naturalists and travellers who have visited that continent, have invariably met with it and collected it.

In size and general appearance, especially to American naturalists,

familiar with the reptiles of their country, it will remind them of *Sceloporus undulatus*, the brown or fence lizard of the farmers and planters.

Descr.—The head is rather elongated, subtriangular when viewed from above, anteriorly somewhat acute. The cephalic plates, obscurely disposed upon longitudinal series, are a little larger on the fronto-nasal region, being all strongly carinated; they are, generally speaking, elongated, lanceolated, some of them being subrhombic, others polygonal, always of a diminutive size; the smallest of all are observed upon the temporal and occipital regions. The occipital plate itself is quite reduced, and hardly perceived in the midst of the surrounding ones. The rostral is very low, transversely very elongated, subangular. The nostril perforates one single, rather conspicuous plate, situated sideways, immediately beneath the ridge of the canthus rostralis, a continuation of the supraocular ridge. The plates occupying the sides of the head constitute irregular longitudinal series, five of which may be counted above the supralabial plates, beneath the eye; they are conspicuously carinated, like the labials themselves, which are somewhat larger, except one slightly curved series, occupying the subocular region, from the nasal plate to the angle of the mouth. The lower labials much resemble the upper, being also carinated. The symphyseal is irregularly pentagonal, all sides nearly equal. Under the head and throat, the scales are small, somewhat larger anteriorly, where they assume a lanceolated shape, than posteriorly, where they become subrhombic; all are conspicuously carinated. The subgular fold is unique, simple, and transversal beneath, and ascending laterally towards the shoulders. The neck is but slightly contracted, covered with very small scales, especially sideways, where, however, may be observed, scattered about, some larger ones, slightly raised above the surface. On the nape, the scales of the medial series, being the largest, are quite compressed, nearly vertical, constituting a crested ridge, which can be traced all along the medial line of the back to the base of the tail. Similar large scales may be seen on each side of the series just alluded to and lining it, forming one series upon the anterior half of the trunk, and two series upon the posterior half, to be continued along the tail. The sides of the body are covered with small, unequal scales, in the midst of which are scattered a few larger ones, all being distinctly carinated. On the abdomen, the scales are

a good deal larger than those on the sides of the body, anteriorly elongated, sublanceolated, whilst posteriorly, they approximate more to a rhombic shape; they are strongly carinated, with their posterior angle very acute, being the prolongation of the keel, on the sides of which a small notch is sometimes observed.

The limbs are moderate: the anterior pair being smaller than the posterior, for, when stretched backwards alongside the body, they do not attain the groins, whilst the posterior pair, similarly brought forwards, will reach the orbit; their upper surface is covered with somewhat large, subrhombic, or lanceolated, and carinated scales, disposed upon longitudinal series; on the inferior surface of the arm, forearm, and thighs, they are small, subrhombic, carinated; under the legs, properly so called, again larger, sublanceolated, and strongly carinated. A series of distant femoral pores may be observed in the male, the series from either side being continuous across the interfemoral region. Under the palm of the hands and sole of the feet, the scales are very small, subrhombic, tricarinated, like the transverse plates under the fingers and toes. The upper surface of the digits just alluded to is protected by well-developed, imbricated, and carinated scales. The nails are compressed, curved, stoutish at their base, and acute upon their extremity. The tail is subconical, twice and a half as long as the body and head combined, covered with imbricated scales; those of its upper surface of the size and shape of the large dorsal ones, to, at least, one-third of the length of the organ, and those of its inferior surface, like the abdominal ones, upon the same extent. Upon the remaining length, the scales are subrhombic, similar all around, imbricated, resembling those of the upper surface of the toes; they are strongly carinated, especially upon the anterior portion.

The coloration varies somewhat according to age. The specimens which we have described are about of the average size the species attains. The upper surface of the head is dark brown. A series of angular black spots may be seen along the dorsal region, with the intermediate spaces of a light brown hue. On each side of these dark spots, there is a light fulvous band, sometimes crossed by the spots. The sides of the body being variegated with light brown, and dark spots or irregular streaks. The limbs and tail are barred with fulvous or light brown and black. The inferior surface of the animal is unicolor, of a light brown hue. A young male specimen exhibits a fulvous band across the interocular region, lined, in front and behind,

by a black streak. The dorsal series of black spots are better defined; the fulvous band is quite distinct, beneath which, on the sides of the body, may be seen another series of transversely elongated, large, black spots, limited beneath by a fulvous fillet or vitta, extending from the axillae to the groins. Under that fillet, along the lowermost portion of the sides, small, obsolete, dark spots may yet be seen. Beneath unicolor, like the adult female.

Loc.—"About fences at Patrick's Plains, &c.," New South Wales, Australia.

2. Amphibolurus maculiferus, Grd.

Char. spec.—*Crista parvula secundum regionem dorsualem medianam protensa. Occipitis lateribus sine squamis spinosis. Squamis gularibus et abdominalibus, cum crurum facie inferiori, obsolete carinatis; gularibus non pendentibus. Corporis latera quibusdam squamis brevibus et erectis sunt ornata. Cauda sine squamarum spinosum serie transversali. Colore flavescente; tergo, cruribus, et cauda nigro fasciatis; abdomine et inferiori caudae facie unicoloribus; gula et membris punctis fuscis notatis.*

Spec. Char.—A diminutive scaly ridge along the middle line of the back. Sides of hind part of the head spineless. Scales of the throat, abdomen, and inferior surface of the limbs, obsoletely carinated; those of the throat not hanging down. Sides of the body with some short and erect scales. Tail without cross rows of spiny scales upon its upper surface. Yellowish, with transverse blackish bands on the back, limbs, and tail; belly and tail beneath unicolor; throat and limbs speckled with blackish.

Syn.—*Amphibolurus maculiferus*, Grd. in Proc. Acad. Nat. Sci. Philad. November, 1857, 198.

Observ.—This species is so closely allied to the preceding one that, upon a first glance, one might well have supposed not to differ from it. This must have been the impression of the naturalists of the Expedition, for we find no mention made of the unique specimen

now before us, a prepared skin, about the size of *A. muricatus*. It is of the female sex, too, and thus compares well with the latter species.

The scales of the upper surface of the head present no material differences; they are irregularly disposed upon longitudinal series, somewhat larger upon the fronto-nasal region, subrhombic, or lanceolated, and strongly keeled; the occipital plate being very small. The supraocular ridge and the position of the nostril immediately beneath it, at equal distance between the anterior rim of the eye and the apex of the snout or muzzle, are equally similar. The scales under the head, on the other hand, are larger, being moderate in size, subequal, subrhombic, slightly carinated, provided with an acute point at their posterior angle. The subgular fold is simple also. The nape and dorsal region of the body exhibit a very slight ridge, amounting to a mere keel on the middle row of scales, which are very slightly raised above the surface. The dorsal scales themselves are nearly equal, well developed, rounded upon their posterior margin, slightly keeled, disposed upon longitudinal series along the middle region of the back; towards the sides, they diminish somewhat in size, the carination itself becoming very obsolete; upon the abdominal region, they appear nearly smooth, equal in size to those of the sides, and obscurely disposed upon longitudinal series. The tail is subconical, slightly depressed at the base, conical, and tapering into a point; it is a little more than twice the length of the body and head together: therefore, proportionally shorter than in *A. muricatus*. The scales of its upper surface resemble, in size and shape, those of the dorsal region, a few of the middle series being carinated, and that very slightly; beneath, they are a good deal smaller than on the abdomen, and nearly smooth also. The scales of the upper and lower surface of the limbs resemble those of the back and belly, bearing the same relation to them as is usually the case in the species of this genus, differing, in the present species, from those of the preceding ones, by the same general features as just referred to.

The ground color is yellowish-olive. The upper surface of the head and neck is dark brown. Five transverse, dark brown, undefined blotches exist along the upper region of the body, making it appear as though entirely brown, with yellow spots along the back, which yellow spots are simply areas of the ground color not occupied by the dark blotches. The flanks are clouded with brownish, fenestrated, or reticulated lines. On the sides of the neck is a double jet-

black spot. The abdomen is unicolor. The under surface of the head and limbs, dotted with black. The limbs and tail above are barred with dark and yellow or yellowish-olive; beneath, the tail being unicolor, like the abdomen.

Loc.—New South Wales, Australia.

Genus OREODEIRA, Girard.

Char. gen.—*Capite depresso, latiori, et breve; scutis parvis, subtuberculosis, et subimbricatis, coöperto. Scuto occipitali ampliori. Naribus lateralibus, intra porcae supraciliaris prolationem sitis. Scutis supralabialibus et squamis temporalibus carinatis. Lingua crassa, antice emarginata vel bifurcata. Dentibus compressis et acutis ad laterem maxillae; incisoriis subconicalibus. Apertura auditoria modica, ejus margine anteriori subserrato; tympano prope orificium exteriorem sito. Plicaturis transversalibus, gulari et pectorali. Colli lateribus diverse plicatis seu corrugatis. Crista parva cervicali, secundum regionem dorsualem evanescente. Squamis dorsualibus modicis, prorsus aequalibus, carinatis, in series obliquas dispositis; abdominalibus parvis, subaequalibus et carinatis; occipitalibus et cervicalibus parvissimis, subgranulosis. Cruribus gracilibus, elongatis; digitis palmarum plantarumque gracilibus, compressis, inaequalibus, et uncinatis. Cauda gracili, subconicali, minuente. Poris femoralibus et praeanalibus nullis.*

Gen. Char.—Head depressed, rather broad and short, covered with small, subtuberculous, and subimbricated plates. Occipital plate rather large. Nostrils lateral, situated within the extension of the supraciliary ridge along the snout. Supralabial plates and temporal scales carinated. Tongue fleshy, anteriorly notched or bifid. Compressed and cutting teeth on the sides of the jaws, and subconical incisors anteriorly. Auricular aperture moderate, subserrated; tympanum situated near its surface. A gular and a pectoral cross fold. Sides of the neck variously folded or rumpled. Nape with a small crest, vanishing away along the back. Scales on the back moderate, homogeneous, keeled, disposed upon oblique series; on the abdomen, small, subequal, and keeled also; on the

occiput and neck, very small, subgranular. Limbs slender and elongated, terminated by slender, compressed, unequal, clawed fingers and toes. Tail slender, subconical, and tapering. Femoral and preanal pores wanting.

Syn.—*Oreodeira*, Grd. in Proc. Acad. Nat. Sci. Philad. November, 1857, 199.

Observ.—This genus represents, in Australia, the group of Phrynocephali, to which it belongs as a distinct type. The cephalic plates and the occipital scales imbricate, in an inverse manner, with those of the back, their anterior margin being thicker and elevated, whilst the posterior margin is thin, and slightly covered over by the adjacent plates or scales, as the case may be.

Oreodeira gracilipes, Grd.

Char. spec.—*Scutis supralabialibus in tres series ordinatis, quam labiales minoribus; infralabialibus exiguis, item in tres series ordinatis. Scutis mentalibus valde parvis, qui ab infralabialibus vix distingui possunt. Femorum facie posteriori squamosa. Squamis caudalibus quam dorsuales et abdominales multo majoribus. Supra olivaceo-fuscata antice maculata; infra olivaceo-flavescente; mento fuscis vel nigris punctis obsoletis notato.*

Spec. Char.—Three complete series of supralabials, smaller than the labials; infralabials exiguous, constituting likewise three series. Mental shields quite small, scarcely distinguishable from the infralabials. Posterior aspect of thighs scaly. Caudal scales conspicuously larger than the dorsal and abdominal ones. Brownish-olive above, anteriorly maculated; beneath yellowish-olive; chin obsoletely spotted.

Syn.—*Oreodeira gracilipes*, Grd. in Proc. Acad. Nat. Sci. Philad. November, 1857, 199.

Descr.—The specimen before us measures two inches and a half, the tail excluded. The head has a short appearance, obtusely triangular when seen from above. Its upper surface is shelving forwards from the ocular regions, which are themselves somewhat convex, is

protected by tuberculous or subtuberculous, unequal scales, smooth in appearance; they are rather small, generally speaking; the occipital alone is quite developed, irregularly hexagonal, with its transverse diameter somewhat more developed than the longitudinal one. The middle supraocular plates are larger than the surrounding ones; and, upon the fronto-nasal region, they are the smallest and most irregular in shape; upon the frontal and interocular regions, they are intermediate in development between those just alluded to; upon the temporal and occipital regions, they resemble those of the frontal regions. The rostral plate is very small, subquadrangularly and transversely elongated. The nostrils perforate a tubular plate, directed backwards, and situated upon the extension of the supraciliary ridge itself, and nearer the apex of the muzzle than the anterior rim of the orbit. The upper labials, which increase in size posteriorly, are but very little larger than the adjoining row of supralabials: the second row of the latter is much smaller than the first; the third is a very exiguous one; all being narrow and long; the differences consisting chiefly in their width. Then follows a series of more conspicuously ridged scales, proceeding from beneath and behind the nostril, and extending to the angle of the mouth. Between the latter row and the inferior rim of the orbit, may be observed several other rows of very small scales. The auricular aperture is subcircular; the tympanum, which is situated near the surface, exhibits a fold somewhat oblique from upwards, downwards, and forwards. The symphyseal plate is large, subtriangular, posteriorly acute. The inferior labials are largest anteriorly, gradually diminishing towards the angle of the mouth. Under the head, the scales are very small, obsoletely carinated: a few series, lining the labials, being somewhat more conspicuous than the rest; under the throat, they are very minute, where two folds of the skin are, moreover, observed: the posterior one regularly transverse; the anterior one broadly V-shaped. The neck itself is rather contracted, covered with small scales, with a few small eminences on each side, over which the scales stand more or less erect. From the neck forwards, the imbrication is reversed, so that the free edge of the scales and plates is the anterior edge. A small crest, composed of equal, compressed, erect, and lanceolated scales, is to be seen, extending from the occiput to the origin of the trunk.

The body is depressed, broader than deep, covered above with moderate, subequal, subrhombic, carinated scales, disposed upon series at

the same time transverse and longitudinally oblique upwards, converging towards the dorsal series, which otherwise has the same shape and size as the rest. The carination is conspicuous, and follows the oblique longitudinal lines. They are somewhat reduced in size as they approximate the lower portion of the sides, and pass, without transition, to the abdomen, where they constitute similar transverse and oblique series, subrhombic in shape; their posterior angle is acute, owing to the prolongation of the keel, which is not very apparent except under the chest. The tail is subconical, depressed at the base, protected by imbricated and carinated scales, larger than those of the body, and somewhat smaller beneath than above. The legs are quite slender: the anterior ones, when stretched backwards alongside the body, are made to reach the groins, while the posterior ones will attain the auricular aperture when similarly dealt with. The scales covering their upper surface are larger than beneath, larger over the arms than the forearms, whilst over the thighs they are smaller than over the legs, properly so called, and, moreover, as large beneath as above, on the latter-mentioned region; over the forearms, they are also equal in size above and below. It is almost needless to say that they are all strongly carinated. Under the palm of the hands and sole of the feet, their size is quite reduced, though preserving their general aspect, such as a rhombic shape and conspicuous keel. Under the fingers and toes, we observe transverse bicarinated plates, and above, small, imbricated, and keeled scales. The nails are compressed, curved, and acute. There are neither femoral nor preanal pores visible upon the specimen examined, in all probability of the female sex.

The color above is brownish-olive, with small black spots over the posterior portion of the head, neck, shoulders, anterior portion of the trunk, and fore-limbs. Beneath yellowish-olive, with obsolete, small spots, under the head alone.

Loc.—New South Wales, Australia.

CHELONIA.

1857.

Ordo IV. CHELONIA.

We come now to the last order, that of the Chelonians, which stands at the head of the class of Reptiles. Turtles seem to be the link, the transition, between their class and the higher classes of vertebrata: the Birds and Mammals.

Nothing more easily recognizable than a reptile of the Chelonian order: a double shield, one more or less convex or arched, is on the back, and known as the carapax; the other is flat or nearly so, opposed to the former, and called the plastron or sternum, both so combined as to constitute a kind of inflexible box or trunk, between the extremities or edges of which, the head, limbs, and tail, may, in most cases, be either entirely or partly retracted or withdrawn.

In all vertebrata, the solid frame is composed of a series of subcylindrical bones, the vertebrae, constituting a flexible chain in the direction of the longitudinal axis of the body, and on the sides of which the ribs are inserted, whilst the sternum, or breast bone, is placed under the latter, forming together a cavity, in which are found the principal viscera of the animal economy, the flesh or muscles enveloping the bony frame. In the Chelonians, the dorsal vertebrae and the ribs expand, and unite more or less intimately together, to form the rigid carapax and the sternum or plastron, both being protected exteriorly either by the skin alone, or else by horny and epidermic shields or large scales; the muscles as well as the viscera being lodged interiorly, the muscles along the inner surface of the bones, the viscera in the cavity proper.

The Chelonians have no teeth properly so to be called; the jaws are generally stout and robustly built, protected by a horny sheath, constituting a bill, in shape not unlike that of some Parrots and birds of prey, their edge being, however, occasionally serrated. The palate is toothless also. As to the tongue, it is thick and fleshy, freely mova-

ble, composed of numerous muscles, though not exsertile, and filling altogether the lower floor of the mouth. The eyes are provided with distinct eyelids, and the drum of the ear or tympanum is either visible exteriorly or hidden under epidermic plates. The legs are short, thickish, and variously constructed, according to habits. The tail is subconical, and the vent or cloacal aperture circular.

The Chelonians are oviparous: the eggs, once laid, receive no further attention from their parents; the young, therefore, are left to their own care. They have numerous enemies in the shark and other carnivorous tribes, of which a large number become an early prey.

In the newly just-hatched young, the carapax is longer than broad in the sub-order of *Chelonii*, whilst it is circular in that of *Testudinata*. In the *Chelonii* also, the snout is more acute, and the upper jaw provided above with a pointed process, which disappears gradually during ulterior growth: the *Testudo nasicornis*, of Lacépède, and the "Rhinoceros Turtle," of Shaw, allude to that transient peculiarity.

As a question of nomenclature, we do not see the propriety of retaining the name of *Testudinata* to designate this Order. True, it is older than that of *Chelonia*, but Klein,* who was the first using it as a prefix to the Turtles, did not characterize the latter as a natural group; and moreover, the terrestrial species being enumerated first on his list, if the name is at all to be preserved, it will naturally revert to the sub-order including those species.

Alex. Brongniart† established the order of Chelonians upon a scientific basis, and his name is the one that ought to be retained.

It is preposterous, at any rate, to use the name of *Testudinata* in one sense, and that of *Chelonians* in another sense, in speaking of these Reptiles.‡

When the law of priority, in regard to scientific nomenclature, cannot be strictly enforced—and such is the case for a good many names of divisions higher than genera—it becomes the duty of the naturalist to select such names as may embody some philosophical idea, or recall to mind some historical fact, affording a safe guide towards further progress.

Thus, if it be admitted that the Reptiles under consideration were

* De Quadrupedum dispositio brevisque historia naturalis, 1751.

† Bulletin de la Société Philomatique de Paris, 1800, 89.

‡ Contributions to the Natural History of the United States of America. I, 1857, 235 (note).

shown to constitute an Order, when the name of Chelonians (*Chelonia*) was applied to them, let these Reptiles be designated under the latter name.

Furthermore, the order of Chelonians subdivides into two natural sub-orders; and, since we find, in either of these sub-orders, a family and a generic name, typifying best their respective group,* we deem it rational to call the first *Chelonii*, and the second *Testudinata*.

Syn.—*Chéloniens*, Brongn. in Bull. Soc. Philom. 1800, 89.—Cuv. Règn. Anim. II, 1817, 6; 2d ed. II, 1829, 5; &, ed. illustr. Rept. 9.—Dum. & Bibr. Erpét. gén. I, 1834, 345; &, II, 1835, 1.—Temm. & Schleg. in *Sieb.* Faun. Japon. Erpét. 1838, 1.

Chelonia, Gray, in Ann. nat. Hist. I, 1838, 275; Catal. Tort. Croc. & Amphisb. Brit. Mus. 1844, 3; &, Catal. Shield. Rept. Brit. Mus. 1855, 1.—Holbr. N. Amer. Herp. I, 1842, 21.

The synonyms of *Testudinata* will be found, further on, under the heading of that sub-order.

Sub-Ordo I. CHELONII.

The Marine Tortoises are easily distinguished from the land and fresh-water tribes, and which constitute the sub-order of *Testudinata*. Their body is very much depressed, cordate or subcordate, generally even on the periphery of the carapax; the plastron, which is always much longer than broad, and immovable, is never completely ossified in the centre, being united to the carapax by a cartilaginous arch. The carapax and plastron, both, are either covered with horny scales or a leathery skin. The ribs remain free at their extremities. They are provided with four limbs, which cannot be withdrawn under the carapax: the anterior pair is much longer than the posterior pair, both of which being constructed to fulfil the act of natation; the digits are very long, individually immovable, firmly united into flippers, pallets, oars, or paddles, very much flattened, rendering their movements powerful and fast in water, powerless and slow on land, sandy beaches, and rocks. The hands are about four times longer than the forearms; and the feet about once again the length of the tibiae or

* *Chelonidae* and *Chelonia*, *Testudinidae* and *Testudo*.

legs, properly so called. There are sometimes two claws to either flipper, at others only one, or else none at all. Whenever present, the thumb nail is more developed in the male sex than in the female. The tail is always short, thickish, subconical, and tapering.

The head is subquadrangular across the orbits, and more or less rounded, abbreviated, or subconical anteriorly, covered with polygonal plates, except in the adult of the "Leather Turtle" (*Sphargis*), in which the skin of that region is smooth and exposed as elsewhere. The orbits themselves are large. The nasal cavity rather small, and wider than long. The tympanum is hidden under the temporal plates. The neck is but little flexible: hence, the head is not retractile under the carapax.

Their food consists chiefly of marine plants, some species feeding likewise on crustacea and molluscs. Essentially of marine habits, they never leave the water, except at the period of laying eggs, which they deposit in the sand, not far from the shore.

This group includes the largest species of the order, and with whom the crocodiles alone, amongst other reptiles, can be compared as to size. The flesh of some of them is served upon our tables, as well as their eggs, which constitute an article of luxury. Others afford to commerce their "shells," which is used for various economical purposes, hence, of great utility to man, as well as a source of considerable revenue.

Syn.—*Chelonii*, Oppel, Rept. Prodr. 1811, 4, 6, & 8.—Gray, in Ann. of Philos. X, 1825, 210; &, Synops. Rept. in *Griff.* Anim. Kingd. IX, 1831, 3.—Wiegm. & Ruthe, Handb. Zool. 1832, 163.—Bonap. Sagg. Distr. Anim. Vertebr. 1831, 70; &, Chelon. Tabul. Anal. 1836, 3.—Agass. Contr. nat. Hist. U. S. Amer. I, 1857, 249 & 308.

Pinnata, Merr. Tent. Syst. Amph. 1820, 17.—Bell, in Zool. Journ. III, 1828, 516.

Carettoidea, Fitz. Neue Class. Rept. 1826, 5.

Eretmochelones, Ritgen, in Nov. Act. Acad. nat. cur. XIV, 1828, 269.

Oiacopoda, Wagl. Naturl. Syst. Amph. 1830, 133.—Fitz. Syst. Rept. I, 1843, 30.

Thalassites, Dum. & Bibr. Erpét. gén. II, 1835, 506.

Thalassidae, Cantor, Catal. Rept. Malay. Pen. 1847, 11.

Sea Tortoises or Turtles, Shaw, Gen. Zool. III, I, 1802.

Observ.—Two families constitute this sub-order, the *Sphargidae*, or Leather Turtles, and the *Chelonidae*, or Scaled Tortoises: of the latter alone, do we find representatives in the collection made by the U. S. Exploring Expedition.

Fam. CHELONIDAE, Bonap.

The *Chelonidae* may be distinguished from the *Sphargidae* at the very first glance by the existence of large epidermic scales covering the carapax and sternum, and by the presence also of horny plates over the head. In *Sphargis*, cephalic plates are observed only in young specimens; in the old, the head exhibiting the naked skin, as well as the surface of the limbs, which in *Chelonidae* are protected by scales and plates of various size and shape. The apex of the lower jaw in *Sphargis* is acerated and curved upwards, whilst the upper jaw is notched laterally as well as anteriorly. In *Chelonidae* the shape and structure of the jaws is peculiar in each genus. It may be that the same would be the case amongst *Sphargidae* were there more than one genus composing it.

Syn.—*Cheloniadae*, Gray, in Ann. of Philos. X, 1825, 212; Catal. Tort. Croc. & Amphisb. Brit. Mus. 1844, 51; &, Catal. Shield. Rept. Brit. Mus. 1855, 70.—Bell, in Zool. Journ. III, 1828, 516.

Chelonidae, Bonap. Sagg. Distr. anim. vertebr. 1831, 71; &, Chelon. Tabul. anal. 1836, 4 & 9.

Chelonioidae, Agass. Contr. Nat. Hist. U. S. Amer. I, 1857, 324.

Cheloniae, Wiegm. & Ruthe, Handb. Zool. 1832, 165.—Fitz. Syst. Rept. 1, 1843, 30.

Observ.—Whilst the family of *Sphargidae* is composed of but one genus and a single well-determined species, that of *Chelonidae* embraces various genera, some of which being composed of several species.

Genus THALASSOCHELYS, Fitz.

Gen. Char.—Head very large; jaws robust, anteriorly compressed, sharp and even upon their margin, and curved towards one another at the tip. Two pairs of frontal plates; an interfrontal, sometimes divided; a vertex plate; and, two pairs of parietals. A middle occipital, very large; two pairs of latero-occipitals; and several post-occipitals. Three postoculars. Mental shields present. Side of lower jaw protected by angular plates. Carapax cordate, ovate, posteriorly indentated upon its periphery, covered with fifteen un-

imbricated shields, ridged in the young, even in the adult; marginal shields twenty-five or twenty-seven in number. Plastron ridged in the young, with six middle pairs of shields and four lateral ones; several postaxillar shields. Two claws to either flipper.

Syn.—*Les Chélonées caouanes*, Dum. & Bibr. Erpét. gén. II, 1835, 551.

Thalassochelys, Fitz. in Zool. Ann. Wien. Mus. (1836), 1841, 128; &, Syst. Rept. I, 1843, 30.—Bonap. Amph. Europ. 1839, 12.—Agass. Contr. Nat. Hist. U. S. Amer. I, 1857, 383.

Caouana, Gray, Catal. Tort. Croc. & Amphisb. Brit. Mus. 1844, 52; &, Catal. Shield. Rept. Brit. Mus. 1855, 72.

Caouanae, Cantor, Catal. Rept. Malay. Pen. 1847, 13.

Observ.—The head is much larger than in any other genus of *Chelonidae*, and the apices of the jaws more powerfully hooked and curved towards one another. The middle occipital plate is remarkable for its development; it seems to be the centre around which most of the others are disposed.

Duméril and Bibron were the first to distinguish the Loggerhead Turtle as a subgeneric group, without however giving any particular name to it. A year afterwards Fitzinger coined for it the generical appellation of *Thalassochelys;* and we dare say that, when John Edward Gray, in 1844, proposed to designate it under the name of *Caouana*, he meant to reinstate that which ought to have been adopted from the very beginning. In that manner the scientific nomenclature would simply have consecrated a vernacular appellation long since in use.

In the "Catalogue of Shielded Reptiles," Gray claims priority for his genus *Caouana* over that of *Thalassochelys*, referring the reader to the "Annals of Philosophy for 1825," where we have been unable to detect it.

The species for which the same author proposes the name of *Caouana elongata* (Catal. Tort. Croc. & Amphisb. Brit. Mus. 1844, 53; &, Catal. Shield. Rept. Brit. Mus. 1855, 73), belongs either to *Thalassochelys* or to *Lepidochelys*, but it is too imperfectly known to enable us to decide that question. It appears to be closely allied to *Testudo cepediana* (Daud. Hist. nat. Rept. II, 1805, 50. Pl. xvii, fig. 1), which, in our judgment, bears stronger affinities to *Lepidochelys* than to *Thalassochelys*.

Thalassochelys corticata, Grd.

(Plate XXIX.)

Spec. Char.—Carapax rather elongated, subcordiform, nearly even in the old, exhibiting three longitudinal ridges in the young, in which the posterior margin is likewise more indentated than in grown-up individuals. Marginal shields twenty-seven. Interfrontal plate divided. Four moderate mental shields in a transverse series. Four unequal, medium-sized plates on the side of the lower jaw, and several small ones posteriorly. Reddish-brown above; yellowish-brown beneath.

Syn.—*Testudo corticata*, Rond. Pisc. Mar. 1554, Lib. XVI, Cap. iii.

Testudo marina, Gesn. Hist. Anim. Quadr. Ovip. 1554, 114; &, Nomencl. Aquat. Anim. 1560, 183.—Aldrov. Quadr. Ovip. 1621, 712. Tab. dccxiv.—Olear. Mus. 1666, 27. Tab. xvii, fig. 1.—Gottw. Physik. Anat. Bemerk. Schildk. 1781. Figs. 1–4.

Testudo caretta, Linn. Syst. Nat. ed. X^{a}, I, 1758, 197; &, ed. XII^{a}, I, 1766, 351.—Walb. Chelonogr. 1782, 4 & 95.—Gmel. *Linn.* Syst. Nat. ed. XIII^{a}, I, iii, 1788, 1038.—Schœpff, Hist. Test. 1792, 67 & 74. Tab. xvi, xvi b, & xvii, fig. 3.—Donnd. Zool. Beitr. III, 1798, 9.—Latr. Hist. nat. Rept. I, 1802, 53.—Shaw, Gen. Zool. III, i, 1802, 85. Tab. xxiii, xxiv, & xxv (Bad).—Cuv. Règn. Anim. 2d ed. II, 1829, 14; &, ed. illustr. Rept. 20.—Holbr. N. Amer. Herp. II, 1842, 33. Pl. iv.

Testudo marina caouana, Catesb. Nat. Hist. Carol. II, 1771, 40. Tab. xl.—Ray, Synops. Meth. Anim. Quadr. 1693, 257.

Testudo cephalo, Schn. Allg. Naturg. Schildkr. 1783, 303.

Testudo caouana, Bonnat. Encycl. méth. Erpét. 1789, 20.—Bechst. *Lacep.* Naturg. Amph. I, 1802, 110.—Daud. Hist. nat. Rept. II, 1805, 54. Tab. xvi, fig. 2.—Cuv. Règn. Anim. II, 1817, 13.

Chelonia caouana, Schweig. Prodr. Monogr. Chelon. in Arch. Königsb. I, 1812, 292 & 418.—Wagl. Naturl. Syst. Amph. 1830, 133. Tab. i, figs. 1 & 26.—Gray, Synops. Rept. in *Griff.* Anim. Kingd. IX, 1831, 53.—Bibr. & Bory, Expéd. scient. de la Moreé, III, i, Zool. 1832, 64.—Dum. & Bibr. Erpét. gén. II, 1835, 552.

Caretta cephalo, Merr. Tent. Syst. Amph. 1820, 18.—Maximil. Beytr. Naturg. Bras. I, 1825, 25.—Risso, Hist. nat. Eur. mérid. III, 1826, 85.

Chelonia caretta, Gravenh. Delic. Mus. Zool. Vratisl. i, 1829, 7. Tab. i, fig. 3.

Chelonia virgata, Wagl. Descr. & Icon. Amph. 1838. Tab. xxix.

Chelonia pelagiorum, Valenc. Rept. Mor. 1832, 64. Tab. x.

Chelonia (Caretta) cephalo, Less. in *Bélang.* Voy. Ind. Orient. Zool. 1834, 300.

Chelonia cephalo, Temm. & Schleg. Faun. Japon. Erpét. 1838, 23. Tab. iv, figs. 1–3.

Thalassochelys caouana, Fitz. in Zool. Ann. Wien. Mus. I, 1841, 128; &, Syst. Rept. i, 1843, 30.—Agass. Contr. Nat. Hist. U. S. Amer. I, 1857, 384. Pl. vi, figs. 13–32, & Pl. vii, fig. 30.

Caouana caretta, GRAY, Catal. Tort. Croc. & Amphisb. Brit. Mus. 1844, 52; &, Catal. Shield. Rept. Brit. Mus. 1855, 72.

Chelonia ruppelii, GRAY, Brit. Mus.

Testudinis marinae pullus, SEBA, Thes. Nat. I, 1734. Tab. LXXIV, fig. 4.

Testudo pedibus pinniformis, &c. GRONOV. Zoophyl. 1781, 71.

Tortue Kahouane, DUTERT. Hist. nat. Antil. II, 1662, 228.

La Caouane, LABAT, Voy. Aux Isles de l'Amér. I, 1722, 304 & 308.—LACEP. Quadr. Ovip. I, 1788, 95.—CUV. Règn. Anim. II, 1817, 13; 2d ed. II, 1829, 14; &, ed. illustr. Rept. 20.—TEMM. & SCHLEG. in *Sieb.* Faun. Japon. Erpét. 1838, 23.

Meerschildkröte, MEYER, Zeitvertr. I, 1748. Tab. XXX & XXXI.

The Loggerhead turtle, BROWNE, Civ. & Nat. Hist. Jamaic. 1756, 465.—CATESB. Nat. Hist. Carol. II, 1771, 40. Tab. XL.

The Mediterranean tortoise, BROWN, New Illustr. Zoolog. 1776, 116. Tab. XLVIII, fig. 5.

Testuggine di mare, CETTI, Stor. di Sardegna, III, 1777, 12.

Caguana, PARRA, Descr. Hist. nat. 1787. Tab. XLIII.

La Tortue nasicorne, LACEP. Quadr. Ovip. I, 1788, 103.—BONNAT. Encycl. méth. Erpét. 1789, 21. Pl. III, fig. 3.

La Tortue caouane, BONNAT. Encycl. méth. 1789, 20.—BOSC, in Nouv. Dict. d'hist. nat. XXXIV, 1819, 256.

Rhinoceros turtle, SHAW, Gen. Zool. III, I, 1802, 95. Tab. XIV.

OBSERV.—There are various opinions entertained regarding the specific identity or difference between the Loggerhead Turtles of the Mediterranean Sea, and the eastern coast of the Atlantic, and those occurring on the western or American coast of that ocean. That they may cross the expansion of water just alluded to, is plausible; for they have been met with in the open sea. Still, the question recurs as to whether we have the same species on the American side, as on the European? It will take a long series of investigations to solve the problem, since it will become necessary to collect extensively, and study them very closely, in either places, and afterwards compare the specimens at various stages of growth.

Not having any other specimen at hand, except the one brought from Madeira, we are not prepared to institute any comparisons towards the elucidation of this subject. We have restored to it the oldest name given to the Loggerhead of the Mediterranean, which is also the oldest bestowed upon the species: so that if it is ever satisfactorily shown that the "Caouane" of the West Indies is of a different species, the name of *Thalassochelys caouana* is the one that will properly revert to it. Then we would have two genuine species in the genus, and two only; for, we propose to show, further on, that the Loggerheads of the Pacific, *Chelonia olivacea* and *C. dussumieri*,

belong to a different genus. The long list of synonyms will have to be subdivided and referred each to its proper species.

The shell of the Loggerhead Turtle is too thin to be of any use to the arts. Its flesh is of a very inferior quality and unfit for the table. The fat is transformed into oil, which is used in the arts.

More than a century and a quarter ago, Labat, in his "Voyages aux Isles de l'Amérique," in speaking of the "Caouane," or Loggerhead Turtle, states, that it grows to a larger size than either the "Green Turtle," or the "Caret," of the same localities.

Descr.—The specimen which lies before us, and from which the accompanying figure was made, is a little over one foot in total length; it is the only one brought home by the Expedition. The vertebral protuberances are still quite prominent, whilst the lateral ones have almost completely disappeared. The periphery of the carapax is likewise still conspicuously serrated. The plastron itself exhibits four interrupted ridges; the two middle ones extending over the six pairs of contiguous shields, forming a sort of stretched ellipsis, whilst the two outer ones extend over the lateral shields, and are a good deal shorter, and less conspicuous. The specimen represented in fig. 1, exhibits an anomaly in the anterior vertebral shield, which is irregularly subdivided into two; the anterior division being the smaller of the two, and more developed upon the left side, where it affects the anterior middle marginal shield, which is quite reduced in width.

The upper aspect of the head is subconvex; its very surface is rendered uneven by elevations and shallow grooves: the middle region of most plates being somewhat raised, whilst their commissure is depressed. The middle occipital plate (*a*) is the largest; the anterior latero-occipitals (*b b*), are next in size; then the anterior parietals (*c c*), the postfrontals (*d d*), the postparietals (*e e*), the vertex plate (*f*), the posterior latero-occipitals (*g g*), the prefrontals (*h h*), the central post-occipital (*i*), the lateral postoccipitals (*k k*), and finally, the inter-frontals (*l l*), which are the smallest when subdivided; whilst, if united into one, it would be subequal with the lateral postoccipitals.

We dare say, the relative size of the cephalic plates may change somewhat, according to the size of the specimen under examination, especially the occipitals of various denominations; still, we believe they never do vary so much as to render their study unavailable for zoölogical purposes. These plates are so accurately represented in

fig. 3, that a more minute description of them is not deemed necessary. The same is the case regarding the plates on the sides of the head, exhibited in fig. 4: five temporal shields (or plates), of considerable development, may be seen: three in front, one above, and one below the tympanic region, properly so called, and which is covered by plates a good deal smaller. On the sides of the lower jaw, there are four irregular plates of moderate size, and about half a dozen of smaller ones, which approximate the angle of the mouth. The mental shields are small, four in number, disposed upon a transverse series, contiguous to the horny sheath of the lower jaw. The rest of the chin exhibits an indurated epidermis variously plaited.

The color is dark reddish-brown above, and yellowish-brown beneath. The cephalic plates are reddish upon their middle region, and yellowish at their periphery.

Loc.—The specimen figured was collected at Madeira, in 1838, on the passage out of the Expedition.

Plate XXIX, fig. 1, represents *Thalassochelys corticata*, in profile.

Fig. 2, exhibits the same animal from below.

Fig. 3, is an upper view of the head; and,

Fig. 4, a side view, with the mouth open, in order to exhibit the outline of the jaws.

All these figures are drawn half the natural size of the specimen.

Genus LEPIDOCHELYS, Fitz.

Gen. Char.—Head moderate; anteriorly compressed; snout rather protruding; jaws sharp and even upon their margin, curved towards one another at the tip. Eye moderate. Two pairs of frontal plates, a vertex plate, and three pairs of parietals. A middle occipital, moderate, sometimes subdivided; two pairs of latero-occipitals; one pair of postoccipitals and occasionally a few small additional ones. Three postoculars. Carapax subcordate, or subelliptical, ample, posteriorly indentated upon its periphery, covered with seventeen to twenty-one unimbricated shields, ridged in the young, smooth in the adult. Marginal shields, twenty-seven in number. Plastron

with six middle pairs of shields, and four lateral ones. One claw to each flipper, either well developed or blunt and rudimentary.

Syn.—*Lepidochelys*, Fitz. Syst. Rept. I, 1843, 30.

Observ.—This genus is more closely allied to *Thalassochelys* than any other of the same family. It differs from it by a somewhat smaller head, smaller eye, the disposition or arrangement of the cephalic plates, and especially by the presence of one claw only to each hand and foot. Eschscholtz already spoke of the affinities of his *Chelonia olivacea* with *C. cephalo*, one of the names given to the Loggerhead or *T. corticata*. Duméril and Bibron themselves placed their *C. dussumieri*, which they consider as identical with *C. olivacea*, in the same subgeneric group with the Loggerhead properly so called. In a philosophical point of view it may be stated that *Lepidochelys* represents in the East Indies the Loggerheads or *Thalassochelys* of the Atlantic Ocean. The flesh is equally unpalatable to a civilized population.

In tracing the further history of *L. olivacea* and *L. dussumieri*, the naturalist must not lose sight of *Caouana elongata* and *Testudo cepediana*, already alluded to above (p. 430).

1. Lepidochelys olivacea, Fitz.

Spec. Char.—Anterior pair of parietal plates contiguous upon their inner margin, and interposing themselves between the vertex plate and the postfrontal pair. Second and third pair of parietals rather large; second pair of postoccipitals smaller than the first pair. Carapax subcordate. Seven unequal vertebral shields, and six or seven costal pairs. Posterior extremity of the carapax but slightly emarginated. A blunt nail to each flipper. Greenish-olive above; pale yellow beneath.

Syn.—*Chelonia olivacea*, Eschsch. Zool. Atlas, I, 1829, 2, Tab. III.—Cantor, Catal. Rept. Malay. Penins. 1847, 13.

Chelonia caouana, var. B. Gray, Synops. Rept. in *Griff.* Anim. Kingd. IX, 1831, 54.

Thalassochelys olivacea, FITZ. in Zool. Ann. Wien. Mus. I, 1841, 128.
Lepidochelys olivacea, FITZ. Syst. Rept. 1, 1843, 30.
Caouana olivacea, GRAY, Catal. Tort. Croc. & Amphisb. Brit. Mus. 1844, 53; &, Catal. Shield. Rept. Brit. Mus. 1855, 73.

OBSERV.—Eschscholtz, who was the first to describe this species, speaks of two specimens which fell under his observation: a young and an adult. According to his own statement, these specimens exhibited various differences, which might have been looked upon as specific, had he not made a comparative study of them. Thus, the width of the carapax when compared to its length, is smaller in the adult than in the young. The young exhibits a prominent ridge along the vertebral line, produced behind in the shape of a spine, and which is no longer observed in the adult, except that the first and fifth vertebral shield are rather convex. The costal shields are seven on either side in the adult, and in the young six on the left side, and seven in the adult. The lateral edges in the adult are horizontal.

The cephalic plates are identical in both the young and the adult, the latter, however, exhibiting an additional odd occipital plate, thrust between the hind part of the postoccipitals. The margin of the jaws is even in either case. The adult is provided with a blunt nail to each fore and hind flipper, whilst the young is clawless.

Most of these differences, however, are of minor importance, with the exception of one, which teaches a morphological fact of great value: we refer to the presence of a blunt nail or claw in the adult, and which the young does not possess. Hence we may conclude, that when the young exhibits any claws whatever, the latter are likely to be found in the adult.

The first pair of cephalic plates might be taken for a third pair of frontals, from the fact of their being contiguous upon the middle line of the cephalic region, and situated in advance of the vertex plate. Whichever be their appellation, the distinctive mark remains the same. Three pairs of contiguous plates are observed in advance of the vertex plate, which is elongated and hexagonal.

The digits are mostly naked or scaleless; the rest of the paddle, or anterior portion of the limbs, is protected by conspicuous scales.

LOC.—Chinese Seas.

2. Lepidochelys dussumieri, Grd.

Spec. Char.—Anterior pair of parietal plates not contiguous upon their inner margin, between which the vertex plate is interposed, the latter touching the postfrontal pair; second and third pairs of parietals rather small; postoccipitals subequal. Carapax subelliptical. Five vertebral shields: three middle ones narrow and elongated; fifth expanded sidewise. Six pairs of costal shields. Posterior extremity of the carapax deeply emarginated. A well-developed and acute claw to each hand and foot. Reddish-brown above; limbs darker than the carapax, except the claws, which are yellowish. Head and neck lighter; centre of cephalic plates reddish, with a yellow margin; jaws yellowish.

Syn.—*Chelonia dussumierii*, Dum. & Bibr. Erpét. gén. II, 1835, 557. (Exclus. syn.)

Observ.—The carapax is subelliptical; that is, less tapering posteriorly than in *L. olivacea*. The first pair of parietal plates, obliquely directed forwards, are situated on the sides of the vertex plate, which is elongated and hexagonal, and contiguous anteriorly to the postfrontals. The second and third pairs of parietals are rather narrow or exiguous, and smaller than the latero-occipitals. The postoccipitals are subelliptically elongated. There are three small additional postoccipitals, one behind the commissure of the typical plates of the same name, the others behind the latero-occipitals. The inferior and middle postorbitals are subequal, elongated, larger than the upper. The temporal plates, or shields, are unequal. The neck is covered with small scales, and the paddles with small plates, largest along the digits and along the edges of these organs.

Loc.—Coast of Malabar.

Remarks on Chelonia virgata, Schw.

The generical affinities of this species remain yet a subject for further investigations. Cuvier supposed it to be more intimately related to the "Caret," of the Red Sea, spoken of by Bruce, than to any of the other types. The figure in the "Iconographie du Règne ani-

mal," is suggestive of a closer relationship to *Lepidochelys* than to *Chelonia*.

The specimen from California, referred to *Chelonia virgata* by Agassiz, exhibits the same generical affinities. A further study of them, together with a comparison of specimens from the various localities where they are said to occur, will undoubtedly reveal some curious results. We subjoin the following references:

Syn.—*Chelonia virgata*, Schw. Prodr. Monogr. Chelon. in Arch. Kœnigsb. I, 1812, 291 & 411.—Cuv. Règn. anim. 2d ed. II, 1829, 14.—Guér. Iconogr. du Règn. anim. 1834, Rept. Tab. I, fig. 4.—Dum. & Bibr. Erpét. gén. II, 1835, 541.—Gray, Catal. Tort. Croc. & Amphisb. Brit. Mus. 1844, 54; &, Catal. Shield. Rept. Brit. Mus. I, 1855, 74.—Cantor, Catal. Rept. Malay. Penins. 1847, 11.—Agass. Contr. Nat. Hist. U. S. Amer. I, 1857, 379.

It is easier to conceive how a sea-turtle might, from the eastern coast of Asia, reach the Red Sea, than its passage from the same coast to California, or *vice versâ*.

Genus CARETTA, Merr.

Gen. Char.—Head small, anteriorly compressed and tapering forwards; snout declivous and protruding; jaws robust, with a blunt and even margin, which is nearly horizontal to the tips. Two pairs of frontal plates; a vertex plate and one pair of parietals; a middle occipital, rather large; two pairs of latero-occipitals, and one pair of postoccipitals. Three postoculars. Mental shields none. Side of lower jaw with an elongated plate. Carapax cordate, ovate, covered with thirteen imbricated shields; marginal shields twenty-five, constituting posteriorly a serrated edge. Plastron, with six middle pairs of shields, and four lateral ones; several postaxillars. Two claws to either flipper.

Syn.—*Caretta*, Merr. Tent. Syst. Amph. 1820, 17.—Fitz. Neue Class. Rept. 1826, 5.—Bonap. Amph. Europ. &c. 1839, 12.—Gray, Catal. Tort. Croc. & Amphisb. Brit. Mus. 1844, 53; &, Catal. Shield. Rept. Brit. Mus. I, 1855, 73.

Chélonées imbriquées, Dum. & Bibr. Erpét. gén. II, 1835, 547.

Cheloniae imbricatae, Cantor, Catal. Rept. Malay. Penins. 1847, 12.

Eretmochelys, Fitz. Syst. Rept. I, 1843, 30.—Agass. Contr. Nat. Hist. U. S. Amer. I, 1857, 380.

OBSERV.—Although the name *Caretta* was framed as early as 1820, this genus was really distinguished and characterized as a natural group, by Duméril and Bibron, fifteen years later, and not by Fitzinger, who wrote eight years after the second volume of the "Erpétologie générale" was published, and who, moreover, never characterized the genus.

A better name than *Caretta* could not have been selected to designate this genus, viewed in the same light as *Caouana* for the Loggerhead; and, it having priority over its competitor, *Eretmochelys*, there is no plausible reason for rejecting it. To say that its present limits are not those originally ascribed to it by Merrem, is mere trifling. Was the Shell Tortoise, *Caretta imbricata*, not included in it by Merrem himself? How many genera of the older writers have met with the same fate, and yet have been universally adopted, although in a restricted sense.

Hence, we cannot perceive why the name *Eretmochelys* should "now be retained," and on what ground "no one has a right to change it hereafter."*

There are several well-marked species of Carets distributed over the warm temperate and torrid zones of both hemispheres. The typical one, and, perhaps, the most ancient on scientific record, is that of the West Indies, or *Caretta imbricata*, MERR. The East Indian species, *Caretta squamosa*, must have been known to navigators and traders before the discovery of America by Columbus; but its history is interwoven with that of *C. imbricata*, to such an extent as to make it a difficult task to divide the various synonyms between the two. We dare say most of the writers of the eighteenth century have spoken of the two indiscriminately, whether they drew their descriptions or observations from specimens or simply quoted their predecessors. At any rate, if the specimens were before them, they never questioned the identity of the two species, hence, never instituted a series of critical comparisons, owing, perhaps, to the fact, that the materials at their command were in too fragmentary a condition.

The Carets of the Polynesian Sea constitute likewise a peculiar species, distinct both from *C. imbricata* and *C. squamosa*. Furthermore, we should not be surprised at hearing of the existence of more than one species in the South Pacific Ocean. The specimens brought home by the U. S. Exploring Expedition seem to foretell that such is

* Contrib. to the Nat. Hist. of the U. S. of Amer. I, 1857, 380,

the condition of things. Future investigators alone will be competent to decide the question rightfully, should they enter the field well prepared for conducting a series of observations upon all the specimens which an Antarctic cruise is likely to place before their eyes.

The "Note-book" of the Expedition, under the head of Broken Bay, Southeast Australia, states that a small specimen of the Caret genus had been observed at that place, and that "it might prove distinct from the Feejees species."

The various species of the genus *Caretta* yield the Tortoise-shell of commerce, which is of various qualities, affecting its market price.* This fact alone would seem to point at a diversity of species. Their flesh is, generally speaking, of an inferior quality, and unpalatable, to Europeans, especially in the East and West Indies. Indeed, in the West Indies, it is spoken of not only as unpalatable but as possessing highly cathartic properties. In the South Pacific Ocean, however, we are informed that "it was tried repeatedly, and not found at all inferior" to that of the true Cheloniae.

1. Caretta imbricata, Merr.

Spec. Char.—Carapax subcordiform, rather elevated; dorsal region shelving; periphery deeply emarginated posteriorly. Vertebral shields ridged along their middle: anterior one triangular; the remaining four rhomboid. Middle occipital plate much broader than long. Middle postorbital smaller than the other two. Skin of the neck without horny plates. Ground color yellow or fawn, marmorated with brown.

Syn.—*Testudo imbricata*, Linn. Syst. Nat. ed. X^{a}, I, 1758, 197; &, ed. XII^{a}, I, 1766, 350.—Walb. Chelonogr. 1782, 46 & 110.—Schn. Allg. Naturg. Schildk. II, 1783, 309; &, Beytr. Naturg. Schildk. in *Leipz.* Magaz. z. Naturk. 1786, 258.—Gmel. in *Linn.* Syst. Nat. ed. XIII^{a}, I, iii, 1788, 1036.—Lacep. Quadr. ovip. I, 1788, 105. Tab. ii.—Schœpff, Hist. Testud. 1792, 83. Tab. xviii A, & xviii B.—Donnd. Zool. Beytr. III, 1798, 3.—Cuv. Tabl. élém. d'hist. nat. 1798, 288; Règn. anim. II, 1817, 13; 2d ed. II, 1829, 13; &, ed. illustr. Rept. 19.—Latr. Hist. nat. Rept. I, 1802, 50. Pl. i, fig. 2.—Shaw, Gen. Zool. III, i, 1802, 89. Tab. xxvi & xxvii.

Testudo caretta, Ray, Synops. meth. Anim. Quadr. & Serp. gen. 1693, 258.

* Annals and Magazine of Natural History. Second Series. Vol. IV, 1849, 297.

Testudo caretta, KNORR, Delic. nat. II, 1767, 124. Tab. XXX.—CATESB. Nat. Hist. Carol. II. 1771, 39. Tab. XXXIX.—BONNAT. Encycl. méth. Erpét. 1789, 21. Pl. IV, fig. 1.—DAUD. Hist. nat. Rept. II, 1805, 39. Pl. XVII, fig. 2.

Chelonia imbricata, SCHW. Prodr. Monogr. Chelon. in Arch. Kœnigsb. I, 1812, 291 & 408.—MAXIMIL. Beytr. Naturg. Bras. I, 1825, 24.—GRAVENH. Delic. Mus. Zool. Vratisl. I, 1829, 6. Tab. I, fig. 2.—WAGL. Naturl. Syst. Amph. 1830, 133.—GRAY, Synops. Rept. in *Griff.* Anim. Kingd. IX, 1831, 52.—DUM. & BIBR. Erpét. gén. II, 1835, 548.—TEMM. & SCHLEG. in *Sieb.* Faun. Japon. Erpét. 1838, 13. Tab. V, figs. 1 & 2.—HOLBR. N. Amer. Herp. II, 1842, 39. Pl. VII.—TSCH. Faun. Peruan. Herp. 1845, 22.—BELL, Hist. Brit. Rept. 1849, 1 (vignette).

Caretta imbricata, MERR. Tent. Syst. Amph. 1820, 19.—GRAY, Catal. Tort. Croc. & Amphisb. Brit. Mus. 1844, 53; &, Catal. Shield. Rept. Brit. Mus. I, 1855, 74.

Chelonia multiscutata, KUHL, Beytr. Zool. & vergl. Anat. 1820, 78.

Eretmochelys imbricata, FITZ. Syst. Rept. I, 1843, 30.—AGASS. Contr. nat. Hist. U. S. Amer. I, 1857, 381.

Testudo marina americana, SEBA, Thes. nat. I, 1734. Tab. LXXX, fig. 9.

Testudinis marinae pullus, SEBA, Thes. nat. I, 1734. Tab. LXXIX, fig. 6.

La Tortue Caret, DUTERT. Hist. gén. Antil. II, 1662, 229.—BONNAT. Encycl. méth. Erpét. 1789, 21.

Scaled tortoise-shell, GREW, Mus. Reg. Soc. 1681, 38. Tab. III, fig. 4.

Le Caret, LABAT, Voy. aux Isles de l'Amér. I, 1722, 304.—LACEP. Quadr. ovip. I, 1788, 105. Tab. II.—CUV. Règn. anim. II, 1817, 13; 2d ed. II, 1829, 13; &, ed. illustr. Rept. 19.—BOSC, in Nouv. dict. d'hist. nat. XXXIV, 1819, 255.

La tuilée, DAUB. Dict. Encycl.

The Hawk's bill Turtle, BROWNE, Civil and Nat. Hist. of Jamaica, 1756, 465.—CATESB. Nat. Hist. Carol. II, 1771, 39. Tab. XXXIX.

La Chelonée Caret, LESS. in Bélang. Voy. Ind. Orient. Zool. 1834, 300.

OBSERV.—The above specific characters are derived from the "Erpétologie générale." The synonymy is given for the reasons already stated, that the history of this species is interwoven with that of *Caretta squamosa*.

LOC.—Atlantic Ocean: West Indies especially.

In the Zoology of Bélanger's "Voyage aux Indes Orientales," pp. 301 & 302, Lesson mentions, as occurring in the Atlantic Ocean:

1. *Chelonia pseudocaretta* (La Chélonée faux Caret), and,
2. *Chelonia bicarinata* (La Chélonée à sternum bicaréné).

But his descriptions of the same are so inaccurate as to leave us in doubt regarding the true affinities of these Turtles.

2. Caretta squamosa, Grd.

(Plate XXX, figs. 1–7.)

Spec. Char.—Carapax cordiform, rather broad across the middle; back subconvex; periphery moderately serrated. Three middle vertebral shields largest and subrhomboid; anterior one smallest. Median postoccipital plates rather broad, sometimes as broad as long. Middle postorbital much larger than the other two. No mental shields. Skin of the neck studded with small horny plates. Ground color yellowish and brownish-olive, maculated with black.

Syn.—*Testudo squamosa*, Ray, Synops. meth. Anim. Quadr. & Serp. gen. 1693, 260.
Testudo imbricata, Penn. Ind. Zool. 1769, 87.
Eretmochelys squamata, Agass. Contr. Nat. Hist. U. S. Amer. I, 1857, 382.
Le Caret, Ferm. Hist. nat. Holl. équinox. 1767, 50.

Observ.—About two centuries ago, Bontius figured and described, under the name of *Testudo squamata*,* an animal inhabiting the rivers of the Island of Java, and which cannot claim a place in the order of Chelonians. If at all a reptile, its relationships must be sought for amongst the Saurians.

The prefix *Testudo*, however, has so much influenced his followers, that the animal referred to has invariably been placed amongst the Turtles.

Thus, Linnaeus† makes it a synonym to the Shell-Tortoise, or *Testudo* (*Caretta*) *imbricata*, without further comment.

Joh. Gottl. Schneider‡ takes some pains to inquire into the nature of the animal, and, although struck with the great resemblance between the figure of *Testudo squamata*, of Bontius, and the quadrupeds now known as *Manis*, he still thinks that Bontius must have had a Turtle in view. He dissents from Linnaeus as to its being a marine species, and places it in the fresh-water group.

* Historiae naturalis et medicae Indiae orientalis Libri sex. Lib. V. Historia animalium. 1658, 82.

† Systema Naturae, &c., ed. XII.

‡ Allgemeine Naturgeschichte der Schildkröte, nebst einem systematischen Verzeichnisse der einzelnen Arten. 1783, 340.

Jo. Frid. Gmelin,* probably influenced by Schneider, concluded to withdraw it from the Sea Tortoises, and place it amongst the fresh-water species, inferring, from Bontius's statement, that it might prove a link between the Lizards and the Turtles.

Lacépède† leaves *Testudo squamata* amongst the synonyms of *Chelonia imbricata*, just as he found it in the twelfth edition of the "Systema Naturae."

Daudin‡ admits the *Testudo squamata*, of Bontius, which he quotes as a species of Turtle, without adding anything of his own on the subject.

After the lapse of about half a century, during which *Testudo squamata* seemed as though entirely forgotten, the name was again exhumed, and applied to a Sea Tortoise, of the Caret group.§

J. Ray‖ is the only one, among the early authors, who perceived the differences between the Carets of the two oceans; but he has remained forgotten altogether.

The "Caretta or Sea Tortoise," alluded to by Bruce¶ as occurring in the Red Sea, may prove identical with the present species. The figure is sufficiently accurate to enable us to decide upon its generical affinities. Its specific characters require a careful reconsideration.

DESCR.**—The occipital plate is the largest; the parietals come next in order; then the postoccipitals, and anterior latero-occipitals, which are subequal; the postfrontals, the posterior latero-occipitals, and the prefrontals, successively.

The prefrontals are transversely elongated, almost parallelogramic in shape. The postfrontals are irregularly angular, subtrapezoid. The vertex plate is subhexagonal, somewhat longer than broad, and nearly as wide anteriorly as posteriorly; it is contiguous in front to the post-occipitals, sideways to the parietals, and behind to the middle occipital. The parietals are elongated, rather narrower anteriorly than poste-

* Caroli a Linné, Systema Naturae, &c., ed. XIII^{a}, aucta, reformata. I, III, 1788, 1040.

† Histoire naturelle des Quadrupèdes ovipares et des Serpents. Vol. I, 1788, 105.

‡ Histoire naturelle des reptiles, II, 1805, 216. (*Tortue écailleuse de Bontius.*)

§ Contributions to the Natural History of the United States of America, I, 1857, 382.

‖ Synopsis methodica Animalium Quadrupedum et Serpentini generis, vulgarum notus characteristicas, rariorum Descriptiones integras exhibens, &c. 1693.

¶ Travels to discover the Sources of the Nile, in the years 1768–1772. Vol. V, 1790, 215. Pl. XLII.

** The following description is based upon figures 1–4.

riorly. The middle occipital is sub-octagonal, its anterior extremity forming an obtuse concave angle, for the reception of the posterior extremity of the vertex plate; its lateral angles are contiguous to the parietals and anterior latero-occipitals; whilst, posteriorly, it comes into contact with the postoccipitals. The latter are somewhat longer than broad, and irregularly angular; a small accessory interoccipital may be seen at the posterior extremity of their commissure. The anterior pair of latero-occipitals is much larger than the posterior pair; both being broader than long. The rim of the orbit is formed superiorly, by the parietal and both pair of frontals, posteriorly by three postorbital plates, and inferiorly by the upper jaw. The middle postorbital is much larger and longer than the two remaining ones; the uppermost is the smallest; the lowermost advances nearly as far as the middle of the orbit. There are three temporal shields, irregularly angular, subequal with the upper and lower postorbitals, whilst five smaller ones occupy the tympanic region, properly so called. The eyelids are covered with coriaceous plates, the uppermost of which are considerably more developed than the rest. The nostrils, large and subcircular, rest upon a notch at the superior and anterior margin of the upper jaw. An elongated shield may be observed on the side of the lower jaw; a few small coriaceous plates occupy the space about the angle of the mouth. There are no mental shields; the skin over the chin and neck is naked, though wrinkled in various ways. The upper surface of the forearm and carpus is protected with polygonal, rather well-developed plates, larger towards their anterior margin than upon their middle; largest and transversely elongated at their posterior margin. The under surface of the arm is mostly covered with the naked skin, some scattered subelliptical and subcircular plates being observed toward its anterior margin alone. On the palms, the plates are more numerous, quite large, and transversely elongated towards their anterior margin, whilst, posteriorly, the skin is exposed. The digits are all plated; the two exterior bear a stout claw, and exhibit the largest plates on their surface; the plates which cover the third and fourth fingers are subquadrangular and well developed, except the terminal one of each, which is more elongated and irregular in shape. A large subelliptical plate occupies the posterior margin of the flipper at the extremity of the fifth finger.

The plates which cover the surface of the hind flipper exhibit the same general aspect as those just described. The two exterior toes

are provided with an equally stout, depressed, and tapering claw. The first, second, and third toes are closely approximated; the fourth and fifth diverge, the interdigital space being covered above and below with much smaller plates. The antero-posterior region of the tarsus and sole exhibiting a naked skin, whilst a rather large, subpentagonal plate may be observed at the posterior margin of the tarsus.

The carapax, which is two feet long, measures likewise two feet across its middle region. In shape it is cordiform, of rather broad appearance, as the measurements just alluded to would lead us to expect. The back is subconvex, somewhat ridged posteriorly. The marginal shields are twenty-five in number: twelve pairs and an odd anterior one. The six anterior pairs are rather narrow, whilst the six posterior pairs are broader, increasing in width backwards. The periphery is but moderately serrated from the seventh pair of marginal shields. The vertebral shields are broader than long, the anterior one is the smallest, the three middle are somewhat larger and subequal with the fifth or posterior one, which is differently shaped, less of a rhomboid figure than the three middle ones. The posterior pair of lateral or costal shields is much smaller than the other pairs.

The eyelid is light blue, and the cornea black. The neck and shoulders are bluish, with pink reflections. The carapax is yellowish and brownish-olive, maculated with black. The plates of the head and flippers exhibit a jet-black spot upon their middle, whilst their periphery is yellow or brown.

Loc.—Sooloo Seas and Indian Ocean.

Plate XXX, fig. 1, represents a profile of *Caretta squamosa*, from the Sooloo Seas, considerably reduced in size.

Fig. 2, an outline of its carapax, viewed from above.

Fig. 3, the head, seen from above;

Fig. 4, a side view of the same.

Figs. 5 & 6, represent outlines of the head of another specimen whose labelling, as to locality, was lost.

Fig. 7, is an outline of a carapax, the label of which has likewise been lost.

3. Caretta rostrata, Grd.

(Plate XXX, figs. 8–13.)

Char. spec.—*Carapace subcordiformi per transversum thoracis quam pelvis angustiori; tergo antice rotundo, postice subconvexo; peripheria modice serrata. Scutis vertebralibus tribus medianis quam reliquos majoribus. Scuto occcipitali latiori quam longiori; scutis postoccipitalibus elongatis, longioribus quam latioribus. Fusco-olivacea, nigro maculata.*

Spec. Char.—Carapax subcordiform, narrower across the chest than the pelvis; back anteriorly rounded, posteriorly subconvex; periphery moderately serrated. Three middle vertebral shields largest. Occipital plate broader than long; postoccipitals elongated, longer than broad. Olivaceous-brown, maculated with black.

Syn.—?

Observ.—The heads and carapaces figured constituting all the materials at our command, a complete description of this species cannot well be drawn up at the present time.

As compared to the preceding species, the one under consideration may be distinguished by a proportionally longer head, and especially a more elongated rostrum. The cephalic plates, the occipitals amongst others, exhibit corresponding differences, which, when once alluded to, are sufficiently prominent to enable any one discriminating between the two species. The outline of the carapax affords also a few peculiarities worthy of special notice: its contraction across the pectoral region, the structure of its anterior margin, the great development of the vertebral shields, are of the number.

The pattern of coloration is the same as in *C. squamosa*, although the black maculae are more confluent, giving the entire body a much darker appearance.

The flesh of this species was tried repeatedly by the Exploring Expedition party, and was not found at all inferior to that of the true Cheloniae.

Loc.—The specimens were procured at the Feejee Islands. How far the species extends over the South Sea has not been ascertained.

Plate XXX, figs. 8 & 10, represent, each, an upper view of two heads of *Caretta rostrata*, somewhat reduced in size;

Figs. 9 & 11, being their profiles.

Figs. 12 & 13, are upper views of two carapaces.

Genus EUCHELYS, Girard.

Char. gen.—*Capite parvo, rotundato; rostro obtuso, abbreviato; maxillis robustis, cum marginibus acutis et integris; apice maxillae inferioris recurvato; maxilla superiori antice emarginata. Scutorum frontalium et parietalium pari uno; scuto verticis uno; occipitali mediano amplissimo; scutorum latero-occipitalium paribus duobus, et pari uno postoccipitalium transverse elongatorum. Scutis postocularibus quatuor. Scutis mentalibus præsentibus. Scuto elongato ad maxillae inferioris laterem. Carapace cordiformi, tredecim scutis non imbricatis tecto; peripheria integra. Sterno sex paribus scutorum medianorum et lateralium quatuor coöperto; scutis postaxillaribus pluribus. Palmis plantisque unguibus duobus praeditis.*

Gen. Char.—Head small, rounded; snout obtuse and abbreviated; jaws robust, with a sharp and even margin; lower jaw curved upwards at the tip; upper jaw somewhat emarginated upon its middle. One pair of frontal plates; a vertex plate, and one pair of parietals. A middle occipital, very large; two pairs of latero-occipitals, and one pair of transversely elongated postoccipitals. Four postoculars. Mental shields present. Side of lower jaw with an elongated plate. Carapax cordate, covered with thirteen non-imbricated shields. Periphery even. Plastron with six middle pairs of shields, and four lateral ones; several postaxillar shields. Two claws to either flipper.

Observ.—This genus partakes of the characters of both *Thalassochelys* and *Chelonia;* of *Thalassochelys*, by the presence of two claws to each hand and foot; of *Chelonia*, by the structure of the head and

jaws. It differs, however, from both, by zoölogical characters easily appreciable.

From *Lepidochelys* it differs in the relative number of the claws, and also by the same structural characters of the head which distinguish it from *Thalassochelys*.

Its nearest relationships are, however, with *Chelonia*, if we take the cephalic plates into consideration. The very great development of the anterior flippers may acquire a generic value from the moment a second species should be found presenting the same feature.

Euchelys macropus, Grd.

(Plate XXXI, figs. 9–11.)

Spec. Char.—Uniform blackish-brown above, with the edge of the carapax and the flippers whitish or yellowish; beneath yellowish, with a black patch on each flipper.

Syn.—*Testudo macropus*, Walb. Chelonogr. 1782, 112.

Testudo mydas, Schœpff, Hist. Testud. 1792, 73. Tab. xvii, fig. 2.—Latr. Hist. nat. Rept. I, 1802, 22. Tab. i, fig. 1.

Observ.—The above synonyms, we dare say, are but a portion of those that may hereafter be referred to this species when its natural history shall have been better investigated, and the various authors, who have treated this subject, better understood, a task which at present was premature to perform. For, it must be remembered that the only materials at our disposal are two immature specimens, one of which we have caused to be figured on the accompanying Atlas, and from which the following description is made.

A great similarity is likely to be found between the young of this species and *Chelonia viridis*, and we are inclined to think that they have often been taken for one another. One character, however, will always be a sure guide: we allude to the presence of two nails to each flipper in *Euchelys macropus*, and one only in *Chelonia viridis*.

Authors, when speaking of *Chelonia viridis*, sometimes ascribe to it one nail to each flipper, and at others, two, without further inquiry into the value of that structure.

DESCR.—The snout is quite compressed, the superior region of the upper jaw, immediately in advance of the nostrils, exhibiting a subacute process which seems to occur in most *Chelonidae* during the early stages of their growth. The anterior aspect of the upper jaw is shelving inwardly downwards, a trait which is gradually obliterated as the animal grows older.

The middle occipital plate is proportionally very large, heptagonal, narrowest anteriorly, the odd angle, which is contiguous to the vertex plate, being the smallest. The vertex plate itself is small, pentagonal, anteriorly acute, engaging between the frontals, which are six-sided and very much elongated. The parietals, which are next to the middle occipital in size, are subrounded and obscurely heptagonal, presenting a broad side to the middle occipital; two small sides: one to the vertex plate, another to the frontals; two others, equally small: one to the anterior latero-occipitals, another to the upper postorbitals; whilst the remaining two sides constitute, together with the frontals, the superior rim of the orbits. The latero-occipitals are obscurely six-sided, the anterior pair being somewhat larger than the posterior pair. The postoccipitals are transversely elongated, contiguous upon the middle line of the occiput, meeting sideways both latero-occipitals. The inferior postorbital is always larger than the three remaining ones, which are either subequal, else, the uppermost or first is the smallest, and the second occasionally larger than the first and third, which in that case are subequal. The temporal shields, or plates, are, as usual, smaller over the tympanum than at its periphery. The extremity of the lower jaw is curved upwards as in *Thalassochelys*. An elongated infra maxillary shield may be observed, followed by three or four quite small plates, beneath the angle of the mouth. The mental shields are but three in number, transversely arranged over the chin. The gular region, throat, and neck exhibit numerous, small, plate-like, dermic indurations, similar to those which may be seen about the axillar and inguinal regions.

Viewed from above, the carapax is regularly cordiform; the vertebral ridge is very obtuse, and the costal ridges very obsolete; its periphery is but very slightly emarginated at the commissure of the marginal shields. Its entire surface is minutely pitted, assuming a somewhat reticulated appearance. The second and third vertebral shields are more developed, transversely, than any of the others, and more regularly hexagonal also, than the first and fifth; the fourth is penta-

gonal. The first and fourth costal shields are subtrapezoid; the second and third pentagono-pyramidal. The marginal shields are twenty-five in number, subequal, somewhat longer than broad posteriorly than anteriorly; the anterior odd one is the largest of all.

The ridges over the plastron are more conspicuous than those of the carapax, without, however, being too prominent; they are more developed along the middle region, than towards the extremities. The vitelline split is yet distinctly seen between the fourth and fifth pair of shields. As usual, the shields constitute six middle pairs, and an anterior odd one, small and triangular in the specimens now before us. The three anterior pairs are narrower than the fourth and fifth. There are four lateral pairs of angular, subequal shields, and from six to eight quite small, postaxillar plates, and a few still smaller preinguinal ones. The skin about the axillae and groins is covered with very small, irregular, and unequal plates, or scales, or dermic indurations, whichever called.

The anterior flippers are very large; when stretched backwards along the periphery of the carapax, they will reach the edge of the last pair of marginal shields. Both their upper and lower surfaces are plated, the plates over the middle region being much smaller than towards the edge. The first and second fingers exhibit each an acute nail, more conspicuous on the first than on the second, which is protected by three plates, the one bearing the nail being larger than the two remaining ones combined.

The hind flippers are very broad and thin, and when extended forwards, along the sides of the plastron, they do not quite reach the axillae. Their upper and lower surfaces are likewise plated, and the plates over their middle regions are much smaller than towards their margin. The first and second toes exhibit also an acute nail, stouter on the first (or thumb) than on the second.

The tail is very small, subconical, and plated; the series of plates along its upper aspect being larger than the rest, and transversely elongated.

The upper surface of the head and carapax is blackish-brown; the temporal plates are blackish in the centre, and yellowish at their margins; the edge of the upper jaw, beneath the eye, is black also; the eyelids and rest of the snout are yellowish-brown. The chin and neck are greyish. The edge of the carapax and the entire plastron are yellowish. The upper surface of the flippers is blackish in the

middle, and yellowish upon their edges. Their inferior surface is mostly yellowish; a black patch existing towards their posterior region, without, however, reaching the terminal edge. The nails are tipped with black. The upper surface of the tail is blackish; the rest is of a dull yellow; the same hue which exists over the inguinal and axillar regions, though blackish maculae may here and there be observed.

Loc.—Mangsi Island, Philippine Archipelago.

Plate XXXI, fig. 9, represents an upper view of *Euchelys macropus*, size of life.

Fig. 10, is an under view of the same animal;

Fig. 11, exhibiting its head in profile.

Remarks on the Genus Halichelys of Fitzinger.

Wishing to place mere historical facts on record, we will first quote from the authors:

Testudo unguibus acuminatis, palmarum plantarumque solitariis, Linn. Amm. Acad. I, 1749, 284.

Testudo atra, Linn. Mus. Adolph. Frider. I, 1754, 50.

The above refer to the young of *Chelonia viridis* or *mydas*, as it is oftentimes called, and which, according to Linnaeus's own statement, came from the Island of Ascension.

Thalassochelys atra, Fitz. in Zool. Ann. Wien Mus. I, 1841, 128.

What has guided Fitzinger in referring *Testudo atra*, of Linnaeus, to the genus *Thalassochelys*, we are at a loss to determine; a prominent trait of the latter genus consisting in the presence of two nails to either flipper.

Halichelys atra, Fitz. Syst. Rept. I, 1843, 30.

Again, when the same author established his genus *Halichelys*, he evidently entertained the idea that its natural affinities were with *Thalassochelys*, since these genera follow one another in his System.

There is a most striking resemblance between the young *Chelonia*, properly so called, and the young *Euchelys;* so much so, that the latter has been figured under the name of *Chelonia mydas* (see p. 448), and quoted as such by various authors. It may, therefore, also have been mistaken for *Testudo atra.*

Walbaum,* in speaking of his *Testudo macropus,* says explicitly that there are two claws or nails to either flipper: "*Scuto ovato, carinato, emarginato, sterno gradato, pedibus pinniformibus, maximis, bifariam unguiculatis.*"

Could Fitzinger have been guided by the above statement in framing his genus *Halichelys?* This might partly account for its association with *Thalassochelys,* which has, likewise, two claws to either flipper; then again how could he omit mentioning Walbaum's *Testudo macropus* as a synonym?

Genus CHELONIA, Brongn.

Gen. Char.—Head small, anteriorly blunt and rounded; snout very obtuse; jaws robust, with a serrated margin, which is nearly horizontal, the lower jaw being slightly curved upwards at the tip, and the upper one slightly emarginated. One pair of frontal plates; a vertex plate, and one pair of parietals. A middle occipital, moderate; two pairs of latero-occipitals, and one pair of longitudinally elongated postoccipitals. Four postoculars. Mental shields extant. Sides of lower jaw protected by an elongated and a few small plates. Carapax cordate or subelliptical, covered with fourteen non-imbricated epidermic shields; marginal shields twenty-five, constituting a nearly even edge. Plastron with six middle pairs of similar shields: four lateral, and several small additional postaxillary ones. One claw to either flipper.

Syn.—*Chelonia,* Brongn. in Bull. Soc. Philom. 1800, 89.—Oppel, Rept. Prodr. 1811, 8.—Cuv. Règn. anim. II, 1817, 12; 2d ed. II, 1829, 13; &, ed. illustr. Rept. 18.—Wagl. Naturl. Syst. Amph. 1830, 133.—Dum. & Bibr. Erpét. gén. II, 1835, 550.—Fitz. Syst. Rept. I, 1843, 30.—Gray, in Ann. of Philos. X, 1825, 210; Catal. Tort. Crocod. & Amphisb. Brit. Mus. 1844, 51 & 54; &, Catal. Shield. Rept. Brit. Mus. 1855, 74.—Temm. & Schleg. in *Sieb.* Faun. Jap. 1838, 12.—Bonap. Amph. Europ. 1839, 12.—Agass. Contr. Nat. Hist. U. S. Amer. I, 1857, 377.

* Chelonographia ad archetypos nativos curiosorum naturae peregrinorum causa latino stylo strictim exarata.

Chelonées franches, Dum. & Bibr. Erpét. gén. II, 1835, 555.
Euchelonia, Tsch. Faun. Peruan. Herp. 1845, 22.
Cheloniae liberae, Cantor, Catal. Rept. Malay. Penins. 1847, 11.

Observ.—This genus is restricted, by modern writers, to the esculent species of the family, those that are most esteemed as an article of food, and generally known under the name of Green Turtles. Their shell is too thin to be made any use of in the arts. Labat states that the West Indies species does not grow as large as the Loggerhead of the same localities, it being intermediate in size between the latter and the "Scaled Tortoise," or "Caret."

Accurate graphic illustrations of *Chelonia viridis* are still a desideratum. Being the typical species of the genus, figures of the others can have but a secondary interest in themselves. Had we had an authentic specimen, from the West Indies, at our command, we might have enlarged upon the remarks and criticism which we offer further on, respecting the species that came under our observation.

The references to the "Green Turtle" bearing somewhat upon the history of its congeners, it was deemed advisable to present them to our readers according to the plan we have adopted.

1. Chelonia viridis, Temm. & Schleg.

Observ.—The twelfth chapter, in Vol. I, of Labat's "Voyages aux Isles de l'Amérique," is full of vivid information respecting the mode of catching and use of the Green Turtles of the West Indies.

Syn.—*Testudo viridis*, Schn. Allg. Naturg. Schildkr. 1783, 309. Tab. II.—Latr. Hist. nat. Rept. I, 1802, 48.

Testudo mydas, Linn. Syst. Nat. ed. X^{a}, I, 1758, 197; &, ed. XII^{a}, I, 1766, 350.—Bonnat. Encycl. méth. Erpét. 1789, 19. Pl. III, fig. 2.—Cuv. Tabl. élém. d'hist. nat. 1798, 288; Règn. anim. II, 1817, 13; 2d ed. II, 1829, 13; &, ed. illustr. Rept. 19.—Daud. Hist. nat. Rept. II, 1805, 10. Tab. XVI, fig. 1.—Oppel, Rept. Prodr. 1811, 9.

Testudo viridi-squamosa, Bonnat. Encycl. méth. Erpét. 1789, 20.

Chelonia mydas, Schw. Prodr. Monogr. Chelon. in Arch. Koenigsb. I, 1812, 291 & 412.—Gray, in. Ann. of Philos. X, 1825, 212; &, Syn. Rept. in *Griff.* Anim. Kingd. IX, 1831, 52.—Gravenh. Delic. Mus. Zool. Vratisl. I, 1829, 5. Tab. I, fig. 1.—Wagl. Naturl. Syst. Amph. 1830, 133.—Less. in *Belang.* Voy. Ind. Orient. Zool. 1834, 298.—Dum. & Bibr. Erpét. gén. II, 1835, 538.—Holbr. N. Amer. Herp. II, 1842, 25. Pl. III.—Agass. Contr. Nat. Hist. U. S. Amer. I, 1857, 378.

Caretta esculenta, Merr. Tent. Syst. Amph. 1820, 18.

Chelonia esculenta, Wiegm. & Ruthe, Handb. Zool. 1832, 164.

Chelonia viridis, Temm. & Schleg. in *Sieb.* Faun. Jap. 1838, 18. Tab. iv, figs. 4–6; &, Tab. vi, figs. 1–2.—Gray, Catal. Tort. Croc. & Amphisb. Brit. Mus. 1844, 54; &, Catal. Shield. Rept. Brit. Mus. I, 1855, 75.

Chelonia (Euchelonia) mydas, Tsch. Faun. Peruan. Herp. 1845, 22.

La Tortue franche, Dutertr. Hist. nat. Antil. II, 1662, 227.—Labat, Voy. aux Isles de l'Amér. I, 1722, 182 & 304.—Lacep. Quadr. Ovip. I, 1788, 54. Fig. 1.—Bonnat. Encycl. méth. Erpét. 1789, 19. Pl. iii, fig. 2.—Bosc. Nouv. Dict. d'hist. nat. XXXIV, 1819, 252.

La Tortue franche ou *Tortue verte*, Cuv. Règn. anim. II, 1817, 13; 2d ed. II, 1829, 13; &, ed. illustr. Rept. 19.

Tortue de Mer, Edw. Hist. nat. Ois. IV. Tab. ccii.

La Tortue à écailles vertes, Lacep. Quadr. Ovip. I, 1788, 92.—Bonnat. Encycl. méth. Erpét. 1789, 20.

Testudo marinis viridis, Catesb. Nat. Hist. Carol. II, 1771, 38. Tab. xxxviii.

Testudinis marinae pullus, Seba, Thes. nat. I, 1734, 127. Tab. lxix, fig. 5.

It remains yet to be proved, whether

Testudo japonica, Thunb. Kongl. Vetensk. Acad. nya Handl. VIII, 1787, 178. Tab. vii.—Schn. in Schrift. Gesellsch. Naturf. Fr. Berl. X, 266,

Caretta thunbergii, Merr. Tent. Syst. Amph. 1820, 19,

refer to a species identical with that of the West Indies, or whether it is the one met by Siebold, on the coast of Japan. The figure given by Thunberg, however, is suggestive of *Lepidochelys olivacea*.

Chelonia pseudomydas, Less. in *Belang.* Voy. Ind. Orient. Zool. 1834, 299,

is also one of those species requiring to be carefully looked into before it can be either admitted as distinct, or referred as a synonym to another.

2. Chelonia maculosa, Cuv.

Appears to be a good species, which may, however, prove closely related to that of the Japanese Seas.

Syn.—*Chelonia maculosa*, Cuv. Règn. Anim. 2d ed. II, 1829, 13; &, ed. illustr. Rept. 19.—Dum. & Bibr. Erpét. gén, II, 1835, 544.

But whether

Chelonia lacrymata, Cuv. Règn. anim. 2d ed. II, 1829, 13; &, ed. illustr. Rept. 19,

is identical with it, we are not, for the present, prepared to decide.

3. Chelonia marmorata, Dum. & Bibr.

(Plate XXXI, figs. 5–7.)

Spec. Char.—Head rather small; vertex plate small; middle occipital large; postoccipitals moderate. Lowermost and third postorbitals larger than the second and uppermost; the second occasionally subdivided so as to give five postorbital plates. Upper temporal shield moderate, subequal with the rest, which are smallest over the tympanum. Carapax subovate, elongated; back quite arched or convex. Middle vertebral shields longer than broad. Marginal shields rather large, twenty-five in number.

Syn.—*Chelonia marmorata*, Dum. & Bibr. Erpét. gén. II, 1835, 546. Pl. xxiii, fig. 1.

Chelonia midas, Shaw, Gen. Zool. III, i, 1802, 3. Tab. xxii.

Observ.—This species is here introduced for the sake of comparison with the following one, in order that a certain series of characters of both could be satisfactorily shown. Space did not permit giving a figure of the carapax on the accompanying Atlas. In its outline it differs widely from that of *C. formosa;* it is more of a subelliptical form, the back being more arched, the sides steeper, and the periphery more declivous. The shape of the epidermic shields vary in the same proportion, since their absolute number is the same in both species; the middle dorsal ones are longer than broad.

The head is a good deal smaller than in *C. formosa*, and the cephalic plates, though of a similar type, exhibit various modifications characteristic in either species. The middle occipital, hexagonal in shape, is the most conspicuous; the postoccipitals, subtrapezoid, come next, then the elongated frontals, the subpentagonal parietals, and the irregular latero-occipitals. The vertex plate is the smallest, pentagonal, narrow posteriorly, and angular in front. There are a few supple-

mentary small postoccipitals, resembling more or less the scales scattered over the neck; two, larger than the rest, are placed in immediate contiguity with the posterior pair of latero-occipitals and the temporal shields. The normal number of the postorbital plates is four, though five may occasionally be seen on one side; in the latter instance we found the second subdivided into two. The first or lowermost is elongated and the largest of its series, sometimes subequal with the third, which is similarly elongated; the uppermost is the smallest. The second, when undivided, is intermediate in size between the upper and the lower.

We will not proceed any further, since the specimens of the following species lack the plastron, limbs, and neck.

Loc.—The specimen before us was caught in the Atlantic Ocean.

Plate XXXI, fig. 5, represents an upper view of the head of *Chelonia marmorata*, somewhat reduced in size.

Fig. 6, is a profile; and,

Fig. 7, an under view of the same region.

4. Chelonia formosa, Grd.

(Plate XXXI, figs. 1–4.)

Char. spec.—*Capite amplissimo; scuto verticis modico; occipitali mediano parvo; scutis postoccipitalibus amplissimis. Scuto postorbitali inferiori quam tres reliquos subaequales majori. Scuto temporali superiori quam reliquos sat amplos majori. Carapace subcordato, latiori; tergo depressiusculo. Scutis vertebralibus multo longioribus quam latioribus; marginalibus modicis, quinque et viginti. Fusca, fulvo vel olivaceo maculata.*

Spec. Char.—Head rather large; vertex plate moderate; middle occipital small; postoccipitals large. Inferior postorbital larger than the remaining three, which are subequal. Upper temporal shield much larger than the rest, which are well developed. Carapax subcordate, broad; back rather depressed. Vertebral shields

much longer than broad; marginal shields moderate, twenty-five in number. Brown, maculated with yellowish or olive.

Descr.—The size of the cephalic plates, as given in the above diagnosis, is comparative with the corresponding ones in *C. marmorata*, and must be understood as expressing their proportional development in both species. For, if we enumerate those plates in point of absolute size in the species which is the subject of the present article, the postoccipitals are the largest of the set; the middle occipital comes next in order; then the parietals, the frontals, and finally the latero-occipitals.

But to return to each of those plates: they differ greatly in form from one another. Thus the frontals are elongated, their sides nearly rectilinear, not to say parallel, for they are somewhat narrower anteriorly than posteriorly, in conformity with the general outline of the snout, which is obtusely subconical forwards. A diminutive internasal may be observed at the anterior extremity of the frontal (frontonasal) plates, between their commissure. Posteriorly, the frontals are obtusely triangular, the inner edge of that triangle admitting the anterior portion of the vertex plate, whilst the external edge of the same triangle is contiguous to the parietals. The vertex plate is the smallest, subhexagonal, elongated; narrowest posteriorly, where it emarginates somewhat the anterior edge of the middle occipital; laterally it is contiguous to the parietals. The latter are a little wider than long, obscurely hexagonal, their exterior edge forming with that of the frontals the upper rim of the orbit. Each parietal is contiguous posteriorly to the upper postorbital and anterior latero-occipital, and interiorly to the middle occipital, and as already observed, to the vertex plate itself. The middle occipital is longer than broad, heptagonal, posteriorly acute-angled, anteriorly subconcave upon its contiguity with the vertex plate. Its latero-anterior edges are contiguous to the parietals, laterally to the anterior latero-occipitals, whilst its posterior acute angle engages between the postoccipitals. The latter are quite elongated, sublanceolated, broadest posteriorly, subtruncated behind, and acute-angled in front. Their anterior acute angle engages between the middle occipital and the anterior latero-occipitals, whilst laterally they are contiguous to the posterior latero-occipitals. The anterior latero-occipitals themselves are obscurely hexagonal, longer than broad, anteriorly contiguous to the middle occipital and the

parietals, sideways to the postfrontals and upper postorbital, and behind to the posterior latero-occipitals and uppermost temporal shield. Finally, the posterior latero-occipitals, subtrapezoid and broadest behind, with their longest side contiguous to the postorbitals, are contiguous anteriorly to the anterior latero-occipitals, and exteriorly to the temporal shields. An accessory pair of acutely triangular latero-occipitals may be seen pointing towards the postorbitals, contiguous by their longest side to the posterior latero-occipitals, their base being directed towards the temporal shields.

The posterior rim of the orbit is formed by four plates, the three upper ones subequal, subangular, rather longer than broad; the lowermost, much longer than broad, and the largest of the set, extends as far under the orbit as the middle of the latter aperture. The remaining portion of the inferior rim of the orbit is formed by the maxillary shield. We have already stated that the upper rim was formed by the edges of the frontal and parietal plates.

The temporal shields (or plates) are irregularly angular, unequal, and variously shaped. The two anterior ones, placed in contiguity with the three upper postorbitals, are the largest, and larger also than the postorbitals themselves. The lowermost, placed immediately behind the inferior postorbital, is next in size, elongated, and subequal with the upper and posterior one, which is contiguous superiorly to the posterior latero-occipital plates. Over the tympanum they are moderate-sized, and smallest towards the articulation of the lower jaw. The latter exhibits a large and elongated shield, along its branch, and two small ones towards its articulation. There is also a series of narrow and elongated submaxillary shields, which are somewhat injured upon the prepared specimen before us. The mental shields were removed in the preparation.

The neck and limbs were not preserved; neither was the plastron. The carapax is subcordiform, broad across the middle region, and somewhat contracted upon the pectoral region. The back is rounded, slightly ridged. We observe the usual number of epidermic shields; five vertebral ones, and four on either side. The three middle dorsal shields are much longer than broad, whilst the first and fifth are broader than long; hence, differently shaped, the fifth much larger than the first. The marginal shields are of moderate development, and twenty-five in number. The periphery of the carapax is undulating upon its posterior half, instead of being narrow and even, as in

C. maculosa. Its anterior margin, immediately above the neck, is but very slightly concave; the same is the case immediately above the anterior limbs.

In the young, the dorsal shields are proportionally shorter, compared to their width. The general outline of the carapax does not differ from that of the adult.

The ground color is yellowish-olive, shaded with brown; but this tint appears distinctly on the neck, breast, shoulder, and tail only. The plates which protect the head and the limbs are of a dark blackish-brown, with the very edge alone yellowish. The carapax is densely mottled, clouded, or marmorated, with black and brown, interspersed with whitish or yellowish specks, the remnants of the ground color. The snout and the portion of the jaws not covered by the plates are reddish-brown, a tint which may likewise be traced along the periphery of the carapax, the ciliary and supraciliary edges being yellowish.

Loc.—Feejee Islands.—"This species, together with the following (*Caretta rostrata*), seems to be most frequent about the extensive reefs to the leeward of the principal islands. We saw them principally in pairs, at Muthuata. As an article of food, both are used indiscriminately."—(Note-book Expl. Exped.)

Plate XXXI, fig. 1, represents *Chelonia formosa*, in profile, reduced.
Fig. 2, is an outline of the carapax, seen from above.
Fig. 3, an upper view of the head; and,
Fig. 4, a side-view of the same region.

5. Chelonia tenuis, Grd.

(Plate XXXI, fig. 8.)

Char. spec.—*Carapace subcordiformi, elongato, per transversum thoracis quam pelvis angustiori. Tergo depresso. Scutis vertebralibus subaequalibus, subrhomboideis, aeque latis ac longis, aut latioribus quam longioribus. Scutis marginalibus septem et viginti. Fulva et olivacea, fusco et nigro maculata.*

Spec. Char.—Carapax subcordiform, elongated, narrower across the pectoral region than across the pelvis. Back depressed. Vertebral

shields subequal, subrhomboid; as broad as long, else broader than long. Marginal shields twenty-seven in number. Yellow and olive, maculated with brown and black.

Observ.—The carapax, an outline of which is subjoined, is all that we at present know of this species. Nothing would have proved more interesting than the head and flippers of a turtle apparently so remarkable. Its frame is lightly built; the bones and horny shield being very thin, contrasting strangely with that of *Chelonia formosa* and *Caretta rostrata*, with which it is associated, amongst the Polynesian or Coral Islands.

The anterior edge is subconcave, the odd marginal shield quite narrow and transversely elongated; the next two pairs being the smallest of the series. The posterior pair is longer than broad. The third vertebral shield is the narrowest of the series; this, however, may not prove a constant character. The dorsal region itself is depressed; the sides gradually sloping towards the periphery, which is nearly even, slightly undulated posteriorly. The thoracic region is narrower across its middle than the pelvic region.

The coloration consists of an admixture of brown, black, yellow, and olive, so as to assume a marmorated appearance.

The following remarks we copy from the "Note-book" of the Expedition, under the head of Rosa Island:

"Several individuals were seen, and one captured, viz., a young male. Their trails were frequent in the sand, to the upper part of the beach, visited apparently for the purpose of depositing their eggs; but none of the latter were discovered, though careful search was made. In the shallow part of the lagoon I had an opportunity of witnessing the speed with which they travel in the water, and was surprised to find them to all appearances quite a match for the shark in this respect. The one captured had the alimentary canal crowded with seaweeds (the *Caulerpa*, seen at Raraka), and I am at a loss to imagine where a sufficient supply of this substance can be procured, unless at considerable depth. This may also account for the general scarcity of these animals among these islands where marine vegetables are so rare."

Under the head of Honden Island, we likewise read:

"Two specimens observed near the surf were females, and had very short tails. A male had the tail seventeen inches long, and was found

half way to the beach, a fore and hind flipper chopped off by the sharks, and it was supposed that it had remained ashore to keep out of their way. A fourth specimen, found in the same situation, had a hole bitten out of its side. They were frequently seen swimming from the boats, and probably numbers might have been taken by remaining a night on the island. There is here no vegetable food for them, unless the plants on shore, which did not appear to be cropped."

Loc.—Honden Island, Paumotu Group; Tahiti and Eimeo; Rosa Island.

Plate XXXI, fig. 8, represents an outline, seen from above, of the carapax of *Chelonia tenuis*, considerably reduced in size.

Sub-Ordo II. TESTUDINATA.

The representatives of this group inhabit either dry land, marshy districts, or fresh waters. Their body is generally depressed, broader than deep, rounded, elliptical, or ovate in its outline, which is either even, or variously serrated or emarginated, and covered with epidermic or horny scales, or a soft skin. The plastron is broad, or narrow; immovable, or movable either upon its anterior or posterior half, or both ways at the same time. There are four limbs, an anterior and a posterior pair, subequal, moderate in length, slender or stout, and more or less retractile. The hands and feet are club-shaped, palmated, or semipalmated, the fingers and toes being always movable, terminated in part or in totality by blunt nails or acerated claws, which vary from three to five. The tail is conical, tapering, long or short.

The head is subquadrangular or subcircular across the orbits, protected with plates, or covered with a naked skin; the snout being pointed or abbreviated. The neck is retractile or simply contractile; generally naked, exhibiting sometimes membranous flaps or appendages, and occasionally covered with scales. The eyes, as a general feature, are large, and in a few instances, quite small, compared to the size of the animal. The nostrils are anterior, quite approximated.

The food of the *Testudinata* consists of animal and vegetable substances, according to the genera and species.

The species of this group are of small or moderate size, with a few exceptions, such as the "Galapagos Turtle" amongst the terrestrial tribe, and the "Soft-shelled Turtle" amongst the fluviatile. Some of them are esculent, hence useful to man; their eggs are likewise esteemed, and sought after for the table.

SYN.—*Testudinata*, KLEIN, Quadr. disp. 1751.—OPP. Reptil. Prodr. 1811, 4, 8.—MERR. Tent. Syst. Amph. 1820, 17.—FITZ. Neue Class. Rept. 1826, 5.—BELL, Zool. Journ. III, 1828, 419 & 513.—BONAP. Sagg. Distr. Anim. vertebr. 1831, 70.—TSCH. Faun. Peruan. Herp. 1845, 21.—LEC. in Proc. Acad. nat. Sci. Philad. VII, 1854.

Testudines, WAGL. Naturl. Syst. Amph. 1830, 133.

Amydae, OPP. Reptil. Prodr. 1811, 4, 6, & 9.—AGASS. Contr. Nat. Hist. U. S. Amer. I, 1857, 249 & 310.

Digitata, MERR. Tent. Syst. Amph. 1820, 20.—BELL, Zool. Journ. III, 1828, 513.

Steganopoda, WAGL. Naturl. Syst. Amph. 1830, 133.—FITZ. Syst. Rept. I, 1843, 29.

Tylopoda, WAGL. Naturl. Syst. Amph. 1830, 138.—FITZ. Syst. Rept. I, 1843, 29.

OBSERV.—The name of *Testudinata* is used by the authors quoted above to designate the entire group of Chelonians. None, that we are aware, have restricted it exclusively to the fresh-water and land species, as here proposed, although the latter have occasionally appeared first on their list.

FAM. HYDRASPIDES.

In the "Day-book" of the Expedition, we read, under the heading of Southeast Australia, the following brief remark regarding a species of this family, the specimens of which appear to have been lost, since none were found in the collection, as it came into our hands.

"*Platemys macquaria*, small, the neck not retractile but flexed to one side, and not of unusual length. Disposition inoffensive. Kept in water at Mr. McLeay's."

Now, *Platemys macquaria*, DUM. & BIBR. Erpét. gén. II, 1835, 438, is made the type of the genus *Chelymys* in the "Catal. of Tort. Crocod. & Amphisb. in the Collect. of the Brit. Mus. 1844, 42," where the other synonyms may be found. Consult likewise the "Catalogue of Shield. Reptiles, in the collection of the British Museum. Part 1. Testudinata. 1855, 57."

Fam. EMYDIDAE.

The head is widest across the temporal region; it tapers towards the rostrum, which is generally truncated. The carapax is quite arched in the direction of both its length and width, it being deepest and broadest upon its middle, and declivous anteriorly and posteriorly. The plastron or lower surface is very broad and flattened. The point of union between the carapax and plastron is sloping inwardly downwards, the free edges of both the carapax and plastron projecting considerably beyond the body.

The limbs are rather stoutly built, though not constructed to support the body. The toes are quite variable, according to the peculiarities of habits: long and broadly webbed in such as live mostly in water; short and scarcely webbed in those that are more frequently found on dry land.

The carapax is composed of eight vertebral plates, attached to the united vertebrae, of two independent plates, and on each side of eight costal plates. Its periphery consists of twenty-four plates, eleven lateral pairs and two odd ones, one in front, the other behind. The plastron, which is either hinged or immovable, consists of nine plates, four pairs and an odd one; the second and third pairs constituting the points of union to the carapax.

The exterior surface of both the carapax and plastron exhibits large epidermic scales, the disposition of which varies somewhat according to the genera.

Most species of this family resort more or less to the waters in marshes and pools, along the edges of ponds or still streams; the group of *Cistudinina* alone being exclusively terrestrial.

The average size of the species varies, within considerable limits, from four to fifteen inches in total length.

They are harmless and inoffensive, feeding on insects and worms, and vegetable substances also: captives, they will eat various kinds of fruits and berries.

They lay a variable number of eggs, on dry land, in holes, which they dig with their hind limbs. The eggs are elongated and elliptical, the shells of which are not brittle, but rather flexible, and less calcareous than in the other families.

Syn.—*Emydidae*, Bell, in Zool. Journ. II, 1825, 302; &, III, 1828, 514.—Gray, in Ann. of Philos. X, 1825, 210; Catal. Tort. Crocod. & Amphisb. Brit. Mus. 1844, 13; &, Catal. Shield. Rept. Brit. Mus. I, 1855, 14.

Emydoidea, Fitz. Neue Class. Rept. 1826, 6.

Emydae, Gray, Synops. Rept. in *Griff.* Anim. Kingd. IX, 1831, 17; &, Proc. Zool. Soc. Lond. 1847, 55.—Wiegm. Handb. Zool. 1832, 166.—Fitz. Syst. Rept. 1, 1843, 29.

Emydoidae, Agass. Contr. Nat. Hist. U. S. Amer. I, 1857, 351.

Observ.—The characters of this family, as given above, are chiefly derived from Agassiz's "Contributions to the Natural History of the United States of America." We do not vouch their accuracy, since we have no collection of turtles at our command at the present time, and thus unable to make any comparative study of the various families and subfamilies, which he has recently adopted and partly established for the first time in the work just referred to.

Subfam. CLEMMYDIDAE.

The species of this group are generally speaking of small size, their body being very much arched though elongated, and their plastron immovable. The limbs being rather compact, subequal, and the toes but slightly webbed. In habits rather less aquatic than those of the other subfamilies.

Syn.—*Clemmydoidae*, Agass. Contr. Nat. Hist. U. S. Amer. I, 1857, 356 & 442.

Observ.—This is one of the five subfamilies into which the family of *Emydidae* is subdivided by Prof. Agassiz. The character of the arched body appears to us quite negative, for, in one of the specimens now before us, the carapax is very much depressed, compared to its length and width.

Genus ACTINEMYS, Agass.

Gen. Char.—Skin of the head smooth, scaleless; on the chin and occiput rumpled; on the neck and throat coarsely granular or tubercular in the young, whilst granules or scale-like tubercles are observed in

the adult; groins scaleless also; rest of the limbs scaly; five fingers and four toes, clawed, palmated to the base of the nails. Tail slender and tapering, protected by large quadrangular plates. Outline of carapax subelliptical, anteriorly subconcave, posteriorly notched, with a vertebral bony ridge. Surface of the bones rugose, granular or striated; epidermis smooth in the adult. Anterior edge of the plastron rectilinear; posterior edge broadly angular.

SYN.—*Actinemys*, AGASS. Contr. Nat. Hist. U. S. Amer. I, 1857, 444.

OBSERV.—For the above generical diagnosis, we alone must be held responsible, since the genus is anything but characterized by its author, in the work we have just quoted. The margin of the upper jaw, generally straight in the young, is rather convexly curved in the adult, and the notch at its anterior extremity may be observed in other genera. The radiating and granular striae, which are observed upon the scales in the young, are not altogether peculiar to it, for they may be found to a greater or less degree not only in *Testudo tabulata*, but in several of the genera occurring within the limits of North America. Moreover, these striae not only affect the scales, but may be observed upon the bony plates, constituting the carapax itself, the scales merely reflecting a structure which primarily belongs to the plates alluded to. By removing the scales, the surface of these bones will exhibit traces of that structure, even in the adult, although the scales may assume a perfectly smooth appearance.

ACTINEMYS MARMORATA (Ag.), Grd.

(Plate XXXII.)

CHAR. SPEC.—*Carapace elliptico vel subelliptico plus minusve convexo, carina vertebrali ossea obtusa. Sterno subellipsoideo, antrorsum quam retrorsum latiori. Membris squamosis; squamis in facie anteriori magnis, non imbricatis, in facie posteriori modicis, subtuberculosis. Unguibus robustioribus. Cauda supra carinata, subconica et minuente. Supra plerumque fusco-olivacea, nigro marmorata; infra flavescente, in adulto unicolori, in juniore vero per abdominis regionem nigra.*

SPEC. CHAR.—Carapax elliptical or subelliptical, more or less convex, with an obtuse vertebral bony ridge. Plastron subellipsoid, broader anteriorly than posteriorly. Limbs scaly; scales, on their anterior aspect, large, not imbricated; on the posterior aspect, moderate, subtubercular. Nails rather stout. Tail superiorly keeled, subconical, and tapering. Generally olive-brown above, mottled with black; beneath yellowish, unicolor in the adult, abdominal region black in the young.

SYN.—*Emys marmorata*, B. & G. in Proc. Acad. Nat. Sci. Philad. VI, 1852, 177.

Emys nigra, HALLOW. in Proc. Acad. Nat. Sci. Philad. VII, 1854, 91; &, in U. S. Pacif. R. R. Expl. & Surv. VII, 1858, Rept. p. 3. Pl. I.—GRAY, Catal. Shield. Rept. Brit. Mus. I, 1855, 77.

Actinemys marmorata, AGASS. Contr. Nat. Hist. U. S. Amer. I, 1857, 444; &, II, Pl. III, figs. 5–8.

OBSERV.—When, on a former occasion, we described this species, it was placed provisionally in the genus *Emys*. A specimen of it having been submitted to Prof. Agassiz's inspection, in anticipation of our own final investigations, the result was the establishment of the genus *Actinemys*, under which heading it is here recorded.

It is much to our regret that we cannot enter, at present, into a thorough study of its characters, as derived from adult specimens; since those we possess are all immature, save two dried up carapaces, one of which wants the head and limbs, and the specimens belonging to the Museum of the Smithsonian Institution are not available until Prof. Agassiz shall have completed his descriptions of the same.

DESCR.—The carapax, when viewed from above, is subelliptical in its outline, narrower upon the thoracic region in the male (fig. 2) than in the female (fig. 1). In the young, some are nearly circular, whilst others exhibit already the peculiar subelliptical form which is observed in the adult, only more regularly so than in the male. We should not be surprised hearing that the subcircular ones are the females, and the subelliptical, the males. As the latter grow up, the abdominal or posterior half of the plastron dilates somewhat at the expense of the anterior or thoracic half. The anterior margin is somewhat concave above the neck, and angularly emarginated posteriorly, opposite the base of the tail. A bony and quite obtuse ridge may be observed along the vertebral line, almost equally developed in both

sexes, and scarcely more prominent in the young than in the adult. Differences are also observed in the depth of the body, some individuals, we believe to be female, being much deeper than others, which we take as being the males. The same differences in the depth do not hold good in the young, for amongst the latter we find the subcircular ones more depressed than those which have a subelliptical shape.

In the young, the periphery of the carapax is gently sloping on the sides as well as anteriorly and posteriorly, whilst in the adult, it is much steeper upon the middle of the sides, rather more plane anteriorly, very steep behind, and somewhat raised up on the sides of the pelvic region. As to the very margin itself, it is nearly even, slight indentations being observed at the junction of the scales.

The scales on the back are: five vertebral ones, four on either side, and twenty-five upon the periphery. The same number may be observed in various genera and species: hence, neither generic nor specific characters can be derived from it, although their form and proportions may, to a certain extent, assist in the discrimination of the species. The three middle vertebral scales are subhexagonal, broader than long, considerably more so in the young than in the adult, as exhibited by the accompanying figures. The anterior and posterior scales of the same series are pentagonal, unequal, broader than long in the young, whilst in the adult, the length increases at the expense of the width. The lateral scales, constituting four pairs, are broader anteriorly than posteriorly: the two middle pairs being much higher compared to their width than the other two.

The peripheral scales are twelve pairs, varying in size, and an odd, rather exiguous one, situated upon the middle line, at the anterior margin. The smallest pair are observed on the sides of the thoracic region, and the largest on the sides of the pelvic region.

The surface of the epidermis is, at first, wholly and minutely granular (figs. 13 & 14); degree by degree, as the growth proceeds, the granular surface recedes from the periphery of each scale, towards its centre; the smooth zone, abandoned by the granules, exhibiting fine radiating striae, and, when the growth is completed, the entire surface of the epidermis is perfectly smooth. The bony surface underneath remains more or less rugose and reticulated.

The plastron is broad and subelliptical in its general outline, and overlapped by the carapax. When considered, however, in its detail,

the anterior margin will be found truncated, and its pectoral sides regularly rounded; its junction with the carapax is shelving inwardly downwards; its abdominal region is rounded also, whilst the pelvic region is angular, tapering posteriorly, with the hind margin angularly and broadly emarginated, apparently less so, however, in the male than in the female. Its middle region, in the male, is subconcave, or, at least, flat, whilst it is subconvex or somewhat bulging in the female: a feature more or less common to *Testudinata* at large. There are six pairs of shields over its surface: the anterior pair being the smallest; the posterior pair is the next in size, and subequal with the second pair. As to the surface of the epidermis of this region, it is smooth throughout.

The head is of moderate size, subquadrangularly ovoid, the anterior aspect of the snout being shelving inwardly downwards. The nostrils are anterior, closely approximated, and situated at the upper region of the declivity of the rostrum. The margin of the upper jaw being emarginated or rather notched anteriorly, whilst its branches are either straight or somewhat convex. The lower jaw is very strong upon its symphysis, curved upwards at the apex, which is rather acute (fig. 6). The eyes are large; the lids thick and fleshy, with a horny, thickened edge, obliquely inclined backwards. The tympanum is subelliptical, obliquely inclined backwards, and situated immediately above the angle of the mouth. The skin of the upper surface and sides of the head is smooth and scaleless; that of the chin, neck, and shoulders is variously rumpled, subgranular in the young, and tubercular in the adult.

The limbs are rather stout, though not unusually long; when the anterior pair is stretched backwards, the tips of the nails reach the posterior edge of the bony arch, which unites the plastron to the carapax, whilst the posterior pair, in being extended forwards, brings the tips of its nails to the anterior edge of the same arch. The arms and forearms are protected by unequal and non-imbricated scales, much larger on their anterior than on their posterior aspects. A somewhat larger, cross series, may be observed under the carpus. Over the palm of the hands, they are rounded, and much smaller towards the base of the nails and under the web. The upper surface of the fingers exhibits rather large transverse plates. The nails, five in number, being quite acute.

The skin at the inguinal regions is smooth and scaleless; the ante-

rior aspect of the thighs and knees, and the inferior aspect of the legs, exhibit scale-like tubercles, while the rest of their surface is tubercular; more coarsely over the thighs and legs than over the tarsi, the soles, and the web; on the upper surface of the toes are large and transverse plates. The nails, four in number, are curved and very acute.

The tail is slender and tapering, compressed in the young and seemingly longer than in the majority of the North American *Testudinata*, judging of it from the illustrations accompanying the second volume of the "Contributions to the Natural History of the United States of America." Five longitudinal series of subquadrangular plates may be observed, protecting its surface from the base to the apex, although around the base, which is thicker, there are five additional, intervening, short, and tapering series. They are more developed in the transversal than in the longitudinal direction. There is an upper series, exhibiting a ridge along its middle, a lateral series which is smooth, as well as two inferior series. In the young, the plates at the base of that organ, being rather convex or elevated, assume a tubercular or nodulous appearance.

The color assumes various shades from green to black. The specimen represented in fig. 1 is deep chestnut-brown, and that in fig. 2, light greenish above, both being reticulated with black: the black lines alluded to corresponding to the rugosities of the bones beneath the epidermis. The plastron is uniformly dark brown in the former, and light olive in the latter, with the commissures of the scales black. In the young, figured on the same plate, the upper surface of the carapax is olive-brown, marmorated with black, whilst the inferior surface of its projecting edge, as well as the plastron, is yellowish, with black along the commissures of the scales. In some of the smallest specimens, the middle region of the plastron is entirely black, a hue which is gradually disappearing as the growth proceeds, at least upon the specimens from Puget Sound, now before us. It appears, however, that in some instances, the black predominates at the exclusion of any other shades: such appear to be the specimens which suggested *Emys nigra*.

The head, neck, limbs, and tail are greenish-olive, or yellow, variegated with black; the upper surface of the head being speckled, the chin and neck lineolated, and the limbs spotted. Two narrow streaks, sometimes united into a broader one, and more conspicuous than the rest, are observed extending from the tympanum to the sides of the neck.

Loc.—Puget Sound (Oregon), and Sacramento River (California).

Plate XXXII, fig. 1, represent the outline, half from above and half from below, of a female specimen, from Sacramento River, California.

Fig. 2, a similar outline of a male individual, from Puget Sound, Oregon.

Figs. 3–15, exhibit a series of views taken from young specimens, collected about Puget Sound also, in order to show their relative proportions of length, width, and depth, as well as the granules and ridges of the carapax; and the sternum also, in order to give a correct idea of the general appearance of the species throughout the various stages of its growth.

All these figures are drawn the size of life.

Fam. TESTUDINIDAE.

This family includes the "Land Tortoises," properly so called. The scanty materials of this group now at our command, will not permit us entering into anything like details, whether historical or structural.

Genus TESTUDO, Linn.

Gen. Rem.—This genus has been subdivided by modern writers, and, we believe, with great propriety. Their limits, however, have not, as yet, been properly defined, hence the impracticability of referring the following species to its proper natural group.

Testudo australis, Grd.

Char. spec.—*Capite amplissimo et depressissimo; maxillis antice obtusis. Scutis marginalibus quinque et viginti; scuto nuchali parvissimo. Tergo depresso; scutis vertebralibus secundo et tertio quam reliquos majoribus, transverse elongatis. Supra nigrescente, fulvo-fusco maculata; infra fulvo-fusca, nigro maculata.*

Spec. Char.—Head rather large and quite depressed; jaws anteriorly

rounded. Marginal shields twenty-five; nuchal shield very small. Back depressed; second and third dorsal shields larger than the rest, transversely elongated. Above blackish, maculated with yellowish-brown; beneath, yellowish-brown, maculated with blackish.

Observ.—The "Day-book" of the Expedition thus speaks, in reference to the present species: "A small tortoise was brought us 'from the woods' by a native. It seemed to be well known to others, and was called by them 'Nalala.'"

The erpetologist of the Expedition supposed it to be a young of the "Galapagos Tortoise," which, he states, was kept in captivity at the Bay of Islands (New Zealand), in the neighborhood of which the specimen has been found. Upon comparing it, however, with the Galapagos tortoise, it became very evident that it did not agree with it, either specifically or generically, at least in the restricted sense we now understand genera.

The anterior feet are compressed, and not plantigrade, a character recently assigned exclusively to the genus *Xerobates*.* The width of the head, across the temples, is another trait which it has in common with the latter genus. The plastron is immovable, and its anterior extremity alone is curved upwards; the posterior extremity being quite horizontal.

Descr.—The body of the specimen before us is ten inches long, seven inches wide, and three and a half inches deep.

The head is large and subtriangular, an inch and three-quarters wide across the temples. It is very much depressed; its upper surface being nearly plane. The snout is rather thick, elevated, and abrupt, though anteriorly rounded. The edge of the upper jaw is slightly arched, whilst that of the lower one is horizontal; both being denticulated, or rather serrated. The alveolar grooves of the upper jaw are continuous anteriorly, whilst those of the lower jaw do not meet at the symphysis of these bones.

A pair of frontals and a vertex plate are quite large; the rest of the surface of the head is covered with moderate and polygonal plates. That portion of the jaws not covered by the horny sheath is likewise

* Contributions to the Natural History of the United States of North America, I, 1857, 446.

plated. The supra-tympanic plates are rather well developed. Under the head, over the chin, they are small, subequal, and rounded, whilst those covering the neck, shoulders, and axillae, are very minute, and reduced to mere dermic indurations. They are, again, quite large and unequal, rounded or polygonal, on the anterior aspect of the fore-limbs, as likewise on the external half of their posterior aspects; whilst they are moderate on the inner half of the same surface, under the palms and over the carpi; the nails being robust and well developed. On the posterior aspect of the thighs, under the soles of the feet, and over the tail, the plates are larger than on the rest of the surface of the hind limbs, and about the groins. The nails are less developed than at the anterior limbs.

The dorsal region is quite depressed; the area covered by the second and third dorsal shields is almost plane. The anterior margin of the carapax is nearly straight; the sides are rounded and the lumbar region quite convex. The anterior dorsal shield is the smallest; the fifth is the next in size; the second and third are the largest, and more developed transversely than the rest. The posterior pair of costal shields is the smallest, and the second and third largest. There are twenty-four marginal shields; eleven pairs and two odd ones, a nuchal and a caudal one. The nuchal shield is very small, transversely subelliptical; the caudal shield is largest transversely than any of the others, and its free edge is perfectly even and not incurved. The fifth and six pairs are much higher than all the rest, and somewhat inclined backwards, as in the North American Gopher.

As already stated, the anterior extremity alone of the plastron is curved upwards. The gular pair of shields are rather projecting and rounded upon their free edge. The posterior extremity of the plastron is horizontal and deeply emarginated beneath the tail. The axillary plate is elongated, subtrapezoid; the inguinal plates subtriangular: both being quite developed.

The head, neck, limbs, and tail, are blackish; the carapax is blackish-brown obscurely maculated with yellowish-brown; the plastron is yellowish-brown, maculated with blackish-brown.

Loc.—Bay of Islands, New Zealand.

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